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July, 1946

EDISON ELECTRIC INSTITUTE BULLETIN

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PUBLISHED MONTHLY BY EDISON ELECTRIC INSTITUTE

THE ELECTRIC LIGHT AND POWER INDUSTRY

Current Statistical Data Covering 100 Per Cent of Industry

May, 1945-1946

SOURCE AND DISPOSAL OF ENERGY (In Kilowatthours)—MONTH OF MAY

	1946	1945	%
GENERATION* (Net)			
By Fuel Burning Plants	10,571,832,000	11,803,260,000	−10.4
By Water Power Plants	7,101,224,000	7,605,895,000	− 6.6
Total Generation	**17,673,056,000**	**19,409,155,000**	**− 8.9**
Add—Net Imports Over International Boundaries	152,571,000	167,950,000	− 9.2
Less—Company Use	121,616,000	119,960,000	+ 1.4
Less—Energy Used by Producer	149,255,000	209,410,000	.....
Net Energy for Distribution	**17,554,756,000**	**19,247,735,000**	**− 8.8**
Losses and Unaccounted for	2,490,267,000	2,606,611,000	− 4.5
Sales to Ultimate Customers	**15,064,489,000**	**16,641,124,000**	**− 9.5**

CLASSIFICATION OF SALES

NUMBER OF CUSTOMERS—As of May 31st			
Residential or Domestic	28,811,595	27,737,488	+ 3.9
Rural (Distinct Rural Rates)	1,289,116	1,173,382	+ 9.9
Commercial or Industrial:			
Small Light and Power	4,543,709	4,298,107	+ 5.9
Large Light and Power	168,119	152,331	
Other Customers	120,080	118,246	+ 1.6
Total Ultimate Customers	**34,932,619**	**33,479,554**	**+ 4.3**
KILOWATTHOUR SALES—During Month of May			
Residental or Domestic	2,993,928,000	2,672,192,000	+12.0
Rural (Distinct Rural Rates)	378,832,000	283,146,000	+33.8
Commercial or Industrial:			
Small Light and Power	2,577,614,000	2,476,975,000	+ 4.1
Large Light and Power	7,869,409,000	9,726,379,000	−19.1
Street and Highway Lighting	160,382,000	156,966,000	+ 2.2
Other Public Authorities	462,724,000	670,333,000	−31.0
Railways and Railroads:			
Street and Interurban Railways	369,152,000	383,671,000	− 3.8
Electrified Steam Railroads	201,271,000	220,436,000	− 8.7
Interdepartmental	51,177,000	51,026,000	+ 0.3
Total to Ultimate Customers	**15,064,489,000**	**16,641,124,000**	**− 9.5**
Revenue from Ultimate Customers	**$277,144,700**	**$275,132,200**	**+ 0.7**

RESIDENTIAL OR DOMESTIC SERVICE

AVERAGE CUSTOMER DATA—for 12 months ended May 31st			
Kilowatthours per Customer	1,283	1,180	+ 8.7
Average Annual Bill	$42.60	$41.06	+ 3.8
Revenue per Kilowatthour	3.32¢	3.48¢	− 4.6

(*) By courtesy of the Federal Power Commission.

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EDISON ELECTRIC INSTITUTE BULLETIN

Volume 14 JULY 1946 No. 7

The Electric Companies Advertising Program

Resumé of a Presentation

By P. H. McCance

President, Duquesne Light Company

Before the Annual Meeting of the Edison Electric Institute, New York, June 4, 1946

THE electric industry is finding advertising an extremely effective medium in telling its story to the public, P. H. McCance, President of the Duquesne Light Company, Pittsburgh, told members of the Edison Electric Institute at the Annual Meeting in New York on June 3, 4 and 5. In the five years the campaign has been carried on, there have been many definite indications that its objective of winning friends for the industry is being achieved.

Using charts and film to dramatize his talk, Mr. McCance gave a comprehensive review of the advertising program which was begun as an experiment by 52 operating companies in 1941 and now has expanded to a membership of about 170 companies. He pointed out that the undertaking was predicated on the fact that by a scientific approach to the subject it would be possible first, to find out what people thought of the industry and second, to correct any misunderstandings by an honest and forthright exposition of the facts.

The primary points which the industry decided shou'd be emphasized were the low price of electricity, the efficient service rendered by the business-managed companies, the question of ownership, the heavy taxes paid by the companies, the policy taken in all vital matters, and the consumer benefits of business management. The three specific purposes were to win friends, convince people a good job had been done and to show that no one else could a better job than private industry.

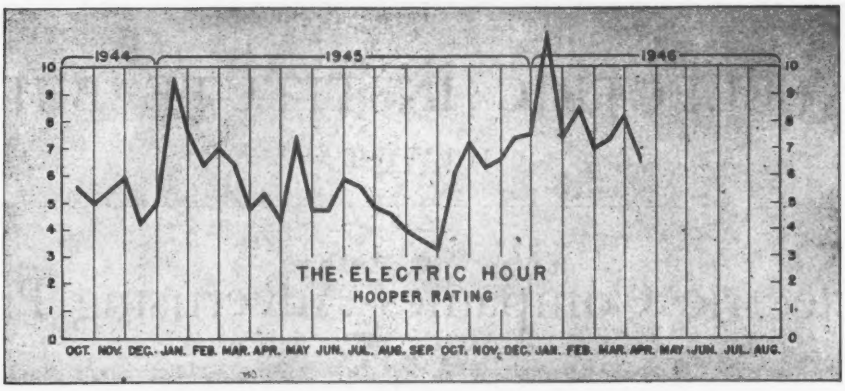
Magazines, newspapers and radio are the three media employed to deliver the industry's message. The magazines have national distribution and include publications in the general and farm categories. They have a combined circulation of 19,400,000. The newspaper campaign is based on a monthly service of three especially prepared advertisements which go to the companies for individual use. The 2976 newspapers now using this service have a total circulation of 20,526,000.

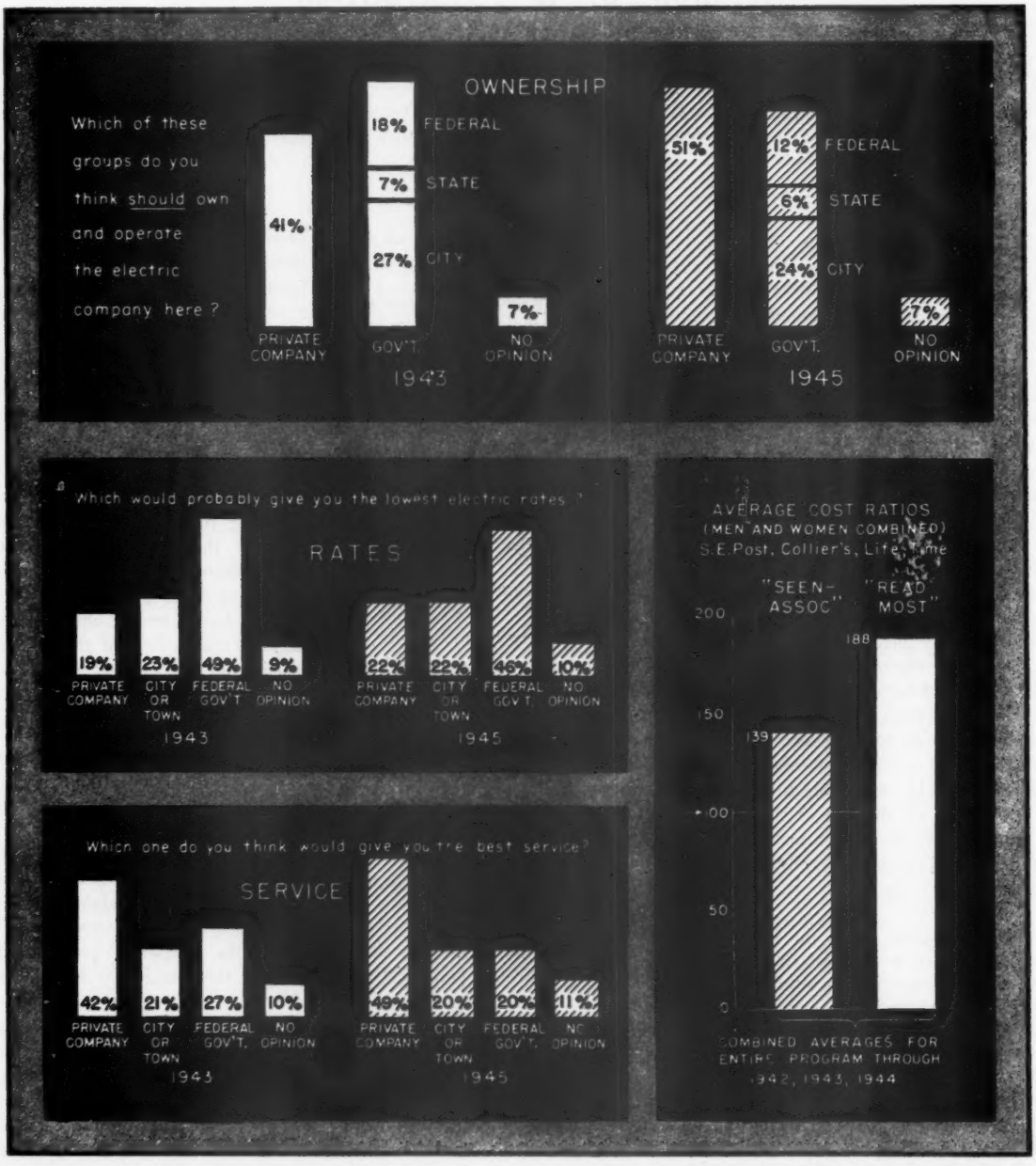
The Sunday afternoon radio program uses the full network of the Columbia Broadcasting System of 143 stations and it reaches 28,150,000 families, 83 per cent of all those that have radios. The Hooper rating of the program in the first year was 6 per cent and in the second 7½ per cent. In its second year the "Electric Hour" has averaged fifth in rating among the 28 Sunday afternoon commercial programs on all four radio networks.

A careful check on the progress of the campaign is kept through periodical testing of public opinion. One of the interesting results of these surveys, Mr. McCance said, is the clear evidence that during the last three years there has been a marked swing of sentiment from government ownership to private operation of industry. It is not claimed that the electric companies' advertising program has been solely responsible for this shift, but the industry feels that it has been a factor because the public now has a better understanding of its position. The companies have been faced with a serious situation as a result of government encroachment and have moved into the forefront in the fight to protect the traditional rights of the American economic system.

Studies of the effectiveness of the advertising program made in 1943 and 1945 by the Opinion Research Corporation show by comparison the results that have been obtained. They show, as is evidenced by the chart on the next page of replies to 3 of the 50 questions asked, that the general attitude of the public toward the power companies is changing definitely for the better.

In the early stages of the campaign, Mr. McCance said, the policy was to bear down on winning friends through a frank exposition of the industry's aims and purposes and to describe the scope of the tremendous job which has been done reaching its highest mark during the war. Now the trend will be to clarify the companies' position with regard to the invasion of the electric service field by the government. It is necessary, he said, that the people have all the facts before them so that they can understand clearly the unfairness of government competition with its own citizens, as well as the implications of that trend with regard to the American way of life.


1944
1945
1946
THE ELECTRIC HOUR
HOOPER RATING
OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY JUN. JUL. AUG. SEP. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY JUN. JUL. AUG.



Results of Survey to Gauge Effectiveness of Electric Companies' Advertising Program

Intensive Selling is a Must

By G. W. Ousler
Vice President, Duquesne Light Company

Address before the Annual Meeting of the Edison Electric Institute, New York, N. Y., June 3, 1946

IT has been a pleasure and a privilege to have served as Chairman of the Commercial Division General Committee of Edison Electric Institute for the past two years. As you all know, the war was still going on during part of this period, retarding somewhat our promotional activities, but during the last year much has been accomplished which we believe will be of assistance to member companies in helping to carry out their local sales operations.

This morning I will attempt to make some observations relative to the necessity for intensive sales activities, the load possibilities in our major markets and indicate what the Commercial Division of EEI can and is doing on a National Basis to aid member companies on the Local Level.

For the privileges granted to public Utility companies they must assume certain obligations with which we are all familiar, and I mention them here merely for emphasis:

1. To provide the best possible service at the lowest possible rates to its customers.
2. To pay fair wages to and provide good working conditions for its employees.
3. To pay to its owners a fair return on the money which they have invested in the property.

Certainly in the past the business-managed Electric Utility Companies have carried out these obligations most successfully. The record speaks for itself. Good management has produced results by concentrating on two major factors:

1. Increasing operating efficiencies and providing more economical operating methods.
2. Increasing the volume of business.

During the past number of years we have been able, through better construction methods, more efficient machinery, improvement in operating conditions of one kind or another, to produce and distribute electricity at lower and lower unit costs, and at the same time provide better and better service. Through active sales promotion we have been able to increase our volume tremendously, improve our load factors, thus lowering fixed charges per unit of output.

But what of the future?

Certainly our obligations to our customers, employees and owners will not change. However, it seems to me that we are not in as flexible a position to carry out these obligations as was true in the past. Wages have risen and are still rising. Material costs have increased tremendously. Taxes are high. While there is still some improvement possible for greater operating efficiencies and improved operating conditions, unless some radical development appears on the horizon, the margin left for reducing costs in this manner is probably getting pretty thin.

Therefore, to continue to carry out our responsibilities, we will have to depend more and more on increasing our output by adding to our lines a greater volume of profitable business. This will take intensive sales effort because very little business comes automatically to any industry, and the public utility industry is no exception. There may be a few who believe that low rates and good service alone will attract business. My experience indicates that this philosophy is unsound. It is true that the public want many things, including electrical equipment and appliances. Purchasing power is still high, although it has suffered some from strikes which have interrupted earnings and depleted savings. But every industry in this country, automobile, home building, furniture, clothing, etc., is going to make a determined effort to get as big a share of the customers' dollar as possible through intensive sales effort and broad advertising programs. If we in the electrical industry are to get our proper share, our sales efforts will have to be equally intensive. Manufacturing of items will not be difficult, distributing and selling these goods will be the major job.

Let us take a look at the load building possibilities in each of the major markets which we supply and some of the problems which we face in these markets.

Residential Market

Our goal in this market is the "all-electric" home with the electric range and the electric water heater as the major contribution. It is well to emphasize here that the electric range has a national saturation of only 13 or 14 per cent and the electric water heater of only 4 or 5 per cent, so that these two appliances are still in the infant stage and offer possibilities of major contributions to an increase in kilowatthours.

The "all-electric" kitchen built around the electric range will have the electric refrigerator with its deep freeze unit, a dish washer, garbage disposal and many other miscellaneous appliances, all of which contribute to labor saving in the home and kilowatthours to our lines.

The modern laundry of tomorrow, of course, will be "all-electric" with the automatic washing machine, electric clothes dryer, ironer and flat iron.

In this "all-electric" home, there are applications for air conditioning, air cleaners such as the precipitron, attic ventilating fans, electric blankets, and all of the other miscellaneous appliances with which most of you are familiar.

Last but not least, we have the possibilities of increased lighting load which nationally represents about one-third of the residential electric business. Very few homes are adequately lighted. The market is very broad for this application.

While there are these possibilities for expansion there are problems to overcome. We will still have severe competition from the gas industry for the range, refrigerator, and the water heater. The use of Liquid Petroleum gas has made rapid strides in many parts of the country in the last few years and is becoming a severe threat to electric cooking and waterheating, particularly in the rural areas. Wiring in most homes is not adequate to properly serve the many appliances which will be a part of the "all-electric" home. Fluorescent lighting can be a threat to our lighting load unless the proper quantity and quality of

light is sold to the residential consumer, particularly in the kitchen and bathroom.

Some companies have set a goal of doubling the annual use-per-customer in the next five years. More conservative figures call for a 30 or 40 per cent increase. No such goals can ever be reached without intensive sales efforts.

Commercial Market

The Commercial Market, including stores, schools, restaurants, gasoline stations and the many other types of business in this classification also has some broad possibilities of expansion, but, at the same time has some problems to overcome. In many instances these problems are more severe than in the Residential Market.

This market offers possibilities for electric cooking, air conditioning, air cleaning, refrigeration, and many other miscellaneous applications of power. It has broad possibilities of expansion in lighting, if the proper approach is made to the market and if we are willing to intensify our selling.

On the other hand, we face severe competition from gas, particularly cooking.

As we all know, lighting in this market is of paramount importance and if we do not sell this new tool—fluorescent lighting—in the proper manner, both as to quantity and quality of light, we will suffer not only from no growth but an actual loss of commercial lighting kilowatthours. Fluorescent lighting offers many opportunities for increased level of illumination and good distribution of light, which will be highly beneficial to our customers. But it will require plenty of sound selling to achieve results.

Industrial Market

During the war many techniques, methods and devices were developed which will make it possible for even broader applications of electric service to our industrial customers. However, there will be needed in this field well-trained men who will be able to prove to our industrial customers benefits which will be derived from the use of these applications.

Electric heating has taken great strides during the war. Increased use of alloy steel has multiplied applications for electric arc furnaces. The electric resistance heat-treating furnace has been so improved that its use will be greatly increased. There are two new load builders of great promise in the electric heating field, one being induction heating or materials and the other dielectric heating of high resistance materials. There are still plenty of applications for midget heating units for such uses as stereotype pots in the printing industry, hot plates in laboratories, for heating liquids, for process kettles, etc. Infrared heating has gained wide popularity, the chief industrial use of this method being for quick drying of surface coatings.

There are many applications for air conditioning in the manufacture of drugs, textiles, food products and other industries which we have not developed.

Many industrial plants are still using steam drive production equipment and many benefits could be derived by the customer if these were converted to electric drive.

Lighting for safety, lighting which will improve the product which is being manufactured, lighting to eliminate rejects are all-important benefits to the manufacturer. It is my feeling that a great many industrial power salesmen and even sales executives have not given sufficient attention to the possibilities of increased lighting load in the industrial markets. An addition of as little as one kilowatt of lighting in a thousand plants is equal to a thousand kilowatt customer.

Again in this market we are going to face some severe competition. First, we have the competition from the private plant, the one which now exists and the one which may be installed. During the war some very efficient generating equipment was developed, even in small units, driven by Diesel engines and steam turbines. We face competition in this market from other forms of fuel for heating processes. But with highly trained men and intensive sales effort we have extremely broad possibilities for expansion.

Rural Market

My close contact with the Rural Committee of the Commercial Division has convinced me that this market also has broad possibilities for expansion. The problems of extending lines in the rural areas has been pretty well solved and the major activity that is now before us is utilization on the farm.

Our rural representatives will have to be entirely familiar with the farmers problems, both in the home and on the farm, in order to properly advise him in selecting appliances and equipment which will be beneficial to him from the point of view of profit, labor saving, comfort and convenience.

In this particular market we have the competition of REA and, as I mentioned before, the very aggressive activities of those who are interested in the sale of Liquid Petroleum gas. If there are some here who have not taken this Liquid Petroleum gas competition seriously, I would advise you to look into the matter immediately because it may shock and surprise you to see the gains this new type of competition is making.

Summing up this very brief picture of the market expansion possibilities and the problems to be overcome means just one thing. The load exits and we can get it if we have the will to go after it. But well-trained personnel and intensive sales effort are a necessity if we are to get our share. As I said before our load will not grow automatically, because every industry will bid for as great a share of the customers' dollar as possible. Needs do not make sales. Selling must convert needs into purchases.

Don't let the next six months or a year fool you. I refer to it as the honeymoon period, when probably anything can be sold, but once the honeymoon is over, and plants are producing in quantity, severe competition will start. Be ready for it.

Now where does the Commercial Division of EEI fit into this picture of intensive selling? Obviously if it contributes nothing it has no reason for existence My close association with the Commercial Division during the last two years has emphasized to me the important part it can and does play in the national selling picture. Its principal asset is that it can develop activities on a nation-wide basis which cannot be economically developed on the Local Level.

Two years ago we re-arranged the Commercial Division so that all activities pertinent to a particular market would be under the direction of one man, and the Chairman of each Market Section is an expert in his field. This was a desirable change because the various committees of the Commercial Division at that time did not seem to be sufficiently coordinated for most effective operation. We now have an Industrial Section, Commercial Section, Residential Section, Rural Section, as the market sections, and two special committees —a Wiring Committee and a Sales Training Committee.

This Commercial Division with its market Sections is fully cognizant of the load building possibilities and problems in each market, the danger points and the applications which I have mentioned, and have developed and are continuing to develop national activities, interchange of information and reports of one kind or another which are available to Member Companies to aid them in their local selling activities. An outstanding example of what the Commercial Division can accomplish is the recently developed Sales Training Course which is now being used by many utilities throughout the country.

About two years ago the Commercial Division decided that one of the major problems facing public utilities was the training of new salesmen which utility companies would need after the war, and the retraining of present personnel who did little or no selling during the war. We, therefore, created a Sales Training Committee to investigate then existing sales training courses, and if none were available which were suitable, to have one prepared which would be appropriate for use by all Member Companies. After some deliberation, the Sales Training Committee determined that a new course would have to be prepared, and the Vocafilm Corporation of New York was finally selected as the firm to prepare it. After further consideration, it was also decided to develop this course in cooperation with the NEWA. However, to be sure that every detail of the course was properly prepared, a group of utility men plus a representative of NEWA spent, for about six months, at least a day or two a week in New York consulting with and helping the Vocafilm Corporation to produce as near a perfect job as possible. The course has recently been completed and consists of a Basic Training Course plus four market courses. It is applicable to utility men and salesmen of manufacturers, distributors, and dealers.

The course cost $140,000 and was underwritten by the Edison Electric Institute. To date 110 utilities plus other associations, such as Electric Leagues, the NEWA, etc., have made purchases amounting to approximately $120,000. It is our opinion that before the year is out sales of these courses will exceed the original cost of $140,000. If any companies represented here have not seen these courses or availed themselves of them, I recommend very strongly that you contact Headquarters and investigate for yourself.

Obviously, it would be impossible for any one Company to burden themselves financially with the preparation of such a course. A Company, such as the one I represent—The Duquesne Light Company in Pittsburgh—with some 360,000 customers has been able to buy enough material to train our salesmen for around $2,500. Certainly we could not afford to develop such a course for ourselves.

Time does not permit to mention all of the studies and activities which are underway in the Commercial Division. I will, therefore, just mention one activity which is now being developed in each one of the Market Sections as an example of the important work which is being developed and which will be available soon to Member Companies.

Of the many projects being considered in the Residential Section I think the most important one is the development of a comprehensive Electric Kitchen Program, including the Electric Water Heater, an activity which will take the place of the old Modern Kitchen Bureau. These plans are progressing rather rapidly and before too long I hope this will be completed and will be helpful in promoting the electric kitchen in your various local territories.

Many subjects are being studied in the Commercial Section. In this field lighting continues to be of paramount importance first, because of steady improvement in light sources, and second, because we must still look to lighting as the largest single load-building opportunity in this Market. One important activity now under consideration is the development of what is believed might well be a nation-wide program on "Planned Lighting," designed to interest local utilities in the development of an activity which will make it possible for our customers to have the advantage of the best possible lighting advice before going ahead with lighting changes. Here again we hope before too long that some of these plans will reach the final stage so that additional contributions can be made to Member Companies for local assistance.

The Industrial Section will soon have four new and revised Sections to add to the Power Sales Manual, covering Motors and Controls, Electric Heat Treating, Industrial Lighting and Industrial Cooking and Baking. This Section has underway at the present time a study covering the field of electric transportation to attempt to determine the importance to the industry of this class of business and will study ways and means of holding and obtaining new business in this field. I am sure when these subjects are completed and in the hands of Member Companies they will be helpful.

The rural Section is busy with important studies. Obviously the first phase of farm electrification was building lines to take service to farm people and this is approaching the stage where for the most part completion is in sight. The business-managed utility companies have done an excellent job in the past years and are continuing even more aggressively extending service to the rural areas. However, the next important phase of our job is utilization on the farm. The 1946 program of the Rural Section is concerning itself primarily with this phase of the program. I am sure that we can look to the Rural Section for much information and help so that we can assist the rural and farm customers in their utilization problems.

Incidentally Roy W. Godley, formerly of the Monongahela Power Company, West Virginia, has just been added to the staff of the Edison Electric Institute as Rural Service Manager. I am sure that this will strengthen the work of the Rural Section because he has had long years of experience in extensive work, in cooperative relations, and is very familiar with problems of rural electric service and utilization.

Our Wiring Section is now busy bringing up-to-date various wiring handbooks which should be available shortly. Promotional activities are being planned to aid in selling the necessity for adequate wiring in the home.

I mention these activities to emphasize the important national contributions which are now in the making as aids to your local selling plans. New problems are continuously arising and plans and activities will always have to be developed on a national basis to aid in the solution of these problems.

One last point before closing. I repeat that the Commercial Division of EEI is in a position to develop activities on a nation-wide basis which cannot be economically developed on the Local Level. One of the best examples of this is the recent Sales Training Course which I have mentioned. However these national

activities are and will be successful only insofar as you make available to the various committees of the Commercial Division the best talent in your organization. In my experience as Chairman of the Commercial Division I have found that most companies are willing to allow some of their best men to serve on committees, but, on the other hand, I have been disappointed in the reaction of a few companies who refuse for one reason or another to allow their personnel to take an active part in this committee work. I realize that we are all busy. But national industry activities are essential and very helpful locally. Men who serve on these committees gain much for themselves and for the companies which they represent. Furthermore, it is too much to expect that men who have served on committees for a few years continue this work indefinitely. Therefore, new members are necessary and all companies should see to it that they assume part of this very important work by allowing men to accept assignments offered to them.

With continuing good talent available to EEI's Commercal Division, Member Companies will be assured of continued valuable assistance to the intensive selling activities which are a "must" for future success.

Activities in the E.E.I. Commercial Department

By James T. Coatsworth

Commercial Director, Edison Electric Institute

Remarks at the Annual Meeting of the Edison Electric Institute, New York, N. Y., June 3, 1946

I AM grateful to you, Mr. Ousler, for your introduction. The opportunity of returning to the electric utility business at such a propitious time as this is fully realized, a time the like of which has not presented itself in many years. It is the threshold of a new era and I believe that in the future as we look back on this year of 1946 it will stand out as a mile post far greater in importance than we currently can discern.

While many may feel that the progress of this industry has marked time during the last several years while a bigger job and a very disagreeable one was completed, some of us have had the opportunity of looking at our industry from the outside and gaining thereby a viewpoint which I hope may in retrospect be of value many times in the future.

During the past two months while becoming oriented again in this great electric industry I have endeavored to learn the many plans and programs of the committee of the Commercial Division of EEI. The work of these 22 organizational committees, as Mr. Ousler has outlined to you, not only has been planned to cover all the desirable phases of promotional effort but is especially well designed to conform with the period of transition through which we are now passing. The program has been streamlined to assist our industry in its preparation to step out again into a load-building endeavor of tremendously expanded proportions.

Each committee of the Commercial Division is so organized and its work so planned as to adapt the results of its efforts to the main overall objective of loadbuilding. We on the Staff of the Commercial Division fully realize the importance to the electric industry of this hour in which we are living—we are fully cognizant of the status of the nation's industry—the problems of the electric appliance manufacturers—but above all we are tremendously impressed by the vast possibilities for loadbuilding and can react only with enthusiasm for the future.

The unlimited growing potential for our business through the development of the *Electrical Living theme* in the American families of today, the load possibilities through the further expansion in the field of *farm electrification*—the opportunities for providing several million *families of veterans* with the comforts and conveniences of electrical living through the successful promotion of the sale of appliances in *new construction*—the possibilities in existing homes now offered in *food freezing—electric cooking — electric water heating* — greater strides in *better lighting*—comfort and health in *air conditioning*, and the ultimate development in the field of *electrical heating;* all this is ours to develop in addition to the vast possibilities in the *commercial* and *industrial* fields with the many new war developed applications making available new opportunities.

Keeping always in mind the *end—product of loadbuilding*—the committees of the Commercial Division will expend their efforts in these general endeavors and projects:

Surveying and analyzing our markets including both current and future,

Instituting programs to eliminate obstacles of competition and in sales resistance thereby providing a more widely prepared field of customer acceptance,

Developing, sponsoring and cooperating in Programs of Sales Promotion activity ranging from the overall theme of Electrical Living to the remotest customer's acceptance and utilization of each individual appliance,

And cooperating with other industry and association programs which ultimately result in mutual benefit.

These briefly are the directions of the efforts of your Commercial Committee.

The Committees are the main sources for ideas gained through the experience and training of the members.

The Committee work succeeds in ratio to the caliber of men you allow to represent you on them. I cannot help but to join with Mr. Ousler in urging you to allow your best men to participate in this work—for so *much* depends on *them.*

Speaking for the Commercial Staff of Edison Electric Institute I pledge to you that we will exert every effort for the maximum success of a load-building program—we are anxious and enthusiastic to serve with all we can contribute—so much can be gained through the collective efforts of the active members in the industry. In pooling our ideas and efforts all can profit where individually little may be accomplished. I know you will lend your support to the Commercial Program which is of paramount importance at this tremendously opportune time.

Aims and Purposes of the National Association of Electric Companies

By P. L. Smith
President, National Association of Electric Companies

Address before the Annual Meeting of the Edison Electric Institute, New York, N. Y., June 5, 1946.

IN SHORT FORM the aims and purposes are stated in the Preamble to the Articles of Association as follows:

"In order to further the interests of the electric utility companies that are members of this Association and their investors, employees and customers; to maintain the integrity and credit of the industry; to present to the public the essential facts about the industry to the end that there may be a better understanding between the utility companies and the public and a better appreciation of utility progress, achievements and problems; to coordinate regional activities among member companies; to furnish member companies information, reports and statements concerning various phases of electric utility operations and developments; to further cooperation with all agencies and organizations interested in the supply and purchase of electric light and power; to furnish such agencies and organizations with information, reports and statements concerning member companies and the electric utility industry; to present the facts to the public concerning the public benefits resulting from the operation of electric utility companies by business men under governmental regulations and, generally, to engage in those practices recognized as being legal and proper to further said ends, certain electric utility companies do hereby establish a national association which shall be adequately qualified and empowered to act in every lawful way when concert of policy and action would be helpful."

The need for such activity, in addition to the activities of the Institute, the Association of Edison Illuminating Companies, and the advertising group, has long been recognized by a majority of the companies in the industry. Many are familiar with the discussions over a period of years and of the various committee meetings of the Institute and other groups prior to the eventual formation of the new Association, which was established in August of last year. Today 107 companies are members of this Association and they constitute about 60 per cent of the volume of electric light and power business done by all of the companies in the industry. Membership is made up by companies from nearly every state in the Union and, therefore, is concerned with the various problems, viewpoints, and geographical distinctions of the entire United States.

Attainment of aims and purposes must be made by gradual steps with some of them taken simultaneously and in unison, and the separate ones being determined by particular necessities from time to time and limitations of budget and personnel. This method was purposely chosen with a view to low cost but especially because the greatest effectiveness is by coordination of material and work of the executives of the member companies and their associates. A very substantial portion of the preparation of the material and its use must be by the member companies, with the Association providing a medium for the correlation and assembly of the combined material and efforts of the members for effective utilization. Added to this is the availability of valuable factual and statistical data prepared by the EEI, the Association of Edison Illuminating Companies, the advertising group, and other sources of information and counsel.

Various methods of assembly and use of material have been employed and additional methods will be developed in the future. A broad dissemination of facts and understanding of the industry is essential and this requires careful appraisal and decision concerning national public relations and publicity. National viewpoints and policies are gradually developing among the companies in the industry on a number of matters and problems that extend beyond state lines or geographical sections and have comparable impacts all over the country.

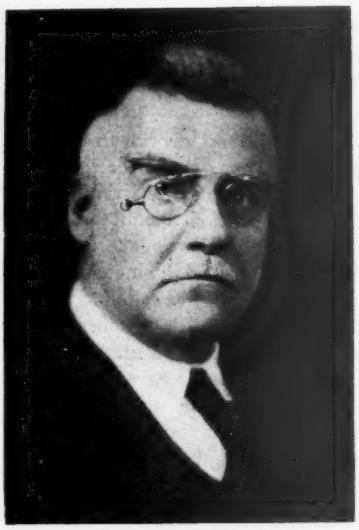
With considerable emphasis we say that the member companies do not and will not ask for any favors—none are needed and none should be sought—but we do say that unjust discrimination and unfair competition should be removed. These latter take various forms of which all of the leaders of the industry are well aware. They must be called to the attention of employees, stockholders, and the general public, to regulatory commissions, administrative agencies, other governmental officials, and Congressmen. Many companies have been losing by default because of previous inaction but present efforts to correct this situation are, as expected, met with cries of power trust lobbying, accompanied by misstatements, distortion of the truth, sarcasm—and we think, fear. Meritorious presentation of facts and honest judgment and opinion, even though it is attacked, will eventually win complete respect, understanding, and intelligent public opinion. That attainment is the principal aim and purpose of the activities of the member companies of the Association. Opposition and smear tactics will not deter us.

Coordinated activities of the member companies and the Association staff to date include:

1. A number of meetings for assembly of factual data, plans for its utilization and actual use of it heretofore and in the future.
2. Several group conferences on public relations and publicity techniques and programs.
3. Distribution of data and informational documents to member companies.
4. Coordinated appearances of executives before congressional committees concerning REA legislation, several appropriation bills and authorizing legislation.
5. Discussion and contacts with the U. S. Army Engineers and a number of the Administrative agencies and commissions.
6. Formation in cooperation with the American Farm Bureau Federation of a

(*Continued on page* 248)

Maxwell Retires—Kent Is Appointed E. E. I. Engineering Director



Alexander Maxwell

ALEXANDER MAXWELL, Director of Engineering of the Edison Electric Institute, retired from service with the Institute on June 30, 1946, after more than a half a century's association with the electric utility industry. Harry E. Kent, who served as principal assistant to Mr. Maxwell during the past several years, has been appointed to succeed him as Engineering Director.

Maxwell's Services to the Industry

Mr. Maxwell was born in New York City in 1878. After a brief connection with the Westinghouse Electric & Manufacturing Company as laboratory and testing department engineer, he joined the Manhattan Electric Company in 1895 as assistant to the Electrical Engineer. Except for a period of military service during World War I as a lieutenant of Engineers and later as a major of the 7th Field Artillery, First Division AEF, in France and Germany, he remained with that company and the New York Edison Company, its successor, until 1923. His responsibilities with the New York company included engineering tests of equipment, standardization of laboratory and measurements, original research in dielectrics, power cable and frequency control, and general field testing for all engineering, operating and sales departments. After the war he was concerned with the problems of stray current electrolysis and inductive coordination, playing an important part in the redesign of the company's dc distribution system.

As an engineer on the staff of the National Electric Light Association from 1923 to its dissolution in 1933, Mr. Maxwell was engaged in research on the economics of power production and distribution. During this period he continued to be active on matters involved in inductive coordination, in addition to administrative duties in the engineering office and his concern with the problems of standardization which were to bring him outstanding distinction in this field.

When the Edison Electric Institute was formed in 1933 Mr. Maxwell was appointed Director of Engineering of the new organization. Under his direction the Engineering Department embraced related fields of insurance, personnel, fuels, coordination with other utilities, codes and standards, and similar subjects involved in the practical management of electric utility companies. He supervised the conduct of the department's liaison duties between the various engineering committees, and acted as consultant for such important groups as the Prime Movers Committee, the Industrial Relations Committee and the Insurance Committee. The author of many definitive papers on engineering and operating subjects, Mr. Maxwell also devoted a considerable part of his time to research in connection with the adjustment of electricity supply operations to the requirements of Federal and local regulations.

Mr. Maxwell is recognized throughout the industry as an authority on the subject of standardization and the formulation of codes affecting power supply and distribution. He has rendered distinguished service as an active member of the Electrical Committee of the National Fire Protection Association charged with the formulation of the National Electrical Code. In industry relations with other bodies similarly concerned, such as the Bureau of Standards, the American Standards Association, the National Electrical Manufacturers Association and others, he has represented the viewpoint and interests of the utility industry.

Harry Kent

Mr. Maxwell is a Fellow of the American Institute of Electrical Engineers and Chairman of its Board of Examiners. He is a member of the Standards Council of the American Standards Association, of its Committee on Scope and of its Electrical Standards Committee. The charter of the latter committee is considered a model of its kind; Mr. Maxwell was a member of the group who originally formulated it.

Although retiring from active service with the Institute, Mr. Maxwell will retain his life-time interest in the utility companies and their problems.

Kent's Professional Career

The entire professional career of Mr. Kent, the new Director of Engineering, has been devoted to engineering activities of the Institute and its predecessor organization.

Born in Providence, R. I., in 1901, Mr. Kent graduated from Massachusetts Institute of Technology with a Master of Science Degree in Electrical Engineering in 1924.

Following graduation, he joined the National Electric Light Association, in

(*Continued on page* 264)

Electric House Heating in the Pacific Northwest

By J. H. Polhemus

President, Portland General Electric Company

Address before the Annual Meeting of the Edison Electric Institute, New York, N. Y., June 5, 1946.

PORTLAND GENERAL ELECTRIC COMPANY felt the beginnings of a definitely forming public demand for full electric house heating some five or six years ago. We are, of course, sensitive to any demand for the service we sell in the belief that an aggressive and pioneering spirit in developing new types of business is a necessary ingredient of our management policy, particularly since we operate in the Pacific Northwest region where we have large surpluses of electric power and where the public is keenly conscious of the need for putting these surpluses to work for the benefit of the region.

In the past we have had many evidences that an aggressive and pioneering approach to business development problems has paid off, not only in profits on our operations, but also in expanded services and benefits for our customers at lower unit costs, and in good public relations. But aggressiveness must be tempered with the knowledge that a new load must be served profitably, and we have approached the electric house heating problem with our eyes fully open to the difficulties which characteristics of this type of load might pose.

At the present time there are more than 700 electrically heated dwellings and apartments connected or on order on lines of the Company, and our sales departments are receiving 35 to 40 inquiries daily. The present demand for electric house heating probably had its origin in the promotions of auxiliary electric heating carried on in the years prior to the war, which demonstrated to considerable segments of the public the automatic, cleanliness and low investment advantages of electric heaters and gained a large degree of public acceptance of the electric heating idea. Our proximity to the Bonneville and Coulee projects, the excess Government power available from them and the efforts of BPA administrators to develop usage of these surpluses also has stimulated the demand for electric heat. Manufacturers of heating equipment also have been active and, finally, shortened supplies and rising costs of competing commonly used fuels have contributed to the public demand.

Having virtually no experience in serving full electric house heating loads when the first installations began to come on our lines back in 1939 and 1940, our company adopted an experimental attitude toward them and in 1941 opened our existing general residential schedule to house heating installations having a connected load in excess of 6 kilowatts, which we classed as an experimental load requiring prior approval of the company. We accumulated approximately 200 installations prior to the outbreak of the war, which precluded carrying out the tests contemplated at that time. We were, however, able to gather some valuable data during the war years, such as desirable home construction features, satisfactory heating capacities, the practicability of certain equipment types, reactions of users, and similar information.

Not until September, 1945 were a suitable number of meters obtainable for commencing the load characteristic studies we had planned. At that time we selected 75 test dwellings on the basis of size, location, connected load, and method of heating as a suitable cross section of users, and upwards of $50,000 was appropriated for the necessary equipment and technical personnel required to make a thorough analysis of the heat-

28 Electrically Heated Court Apartments served by Portland General Electric Company

Each apartment: Volume 3400 cubic feet, connected heating load 8 kw equipped with an electric range and water heater.

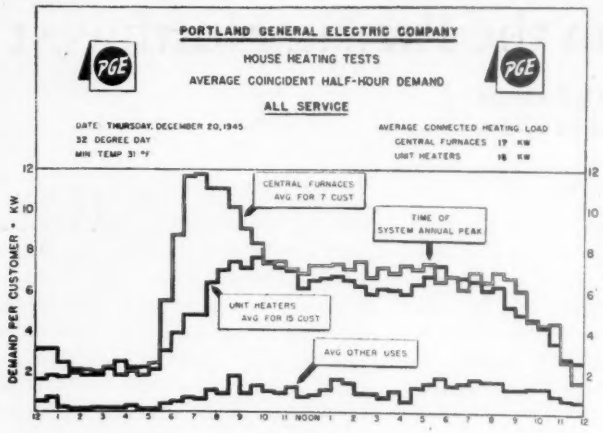


PLATE I

The two upper curves indicate total load including heating for each of two methods of electric house-heating. The lowest of the three curves is the ordinary residential use before space-heating, at 100% range and water heater saturation. The maximum peak on the system of the Company for 1945 occurred on the day for which these curves are shown.

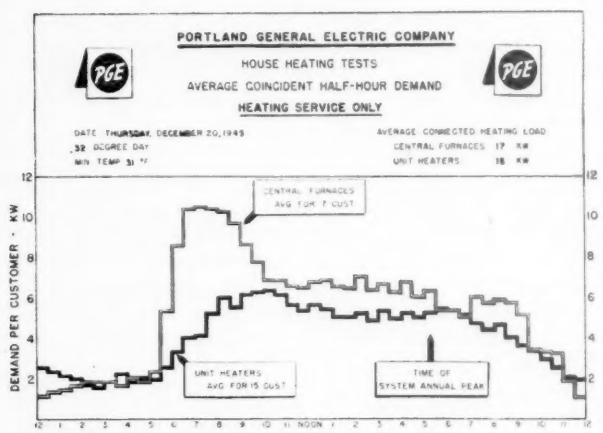

PORTLAND GENERAL ELECTRIC COMPANY
HOUSE HEATING TESTS
AVERAGE COINCIDENT HALF-HOUR DEMAND
HEATING SERVICE ONLY
DATE: THURSDAY, DECEMBER 20, 1945
32 DEGREE DAY
MIN. TEMP 31 °F
AVERAGE CONNECTED HEATING LOAD
CENTRAL FURNACES 17 KW
UNIT HEATERS 18 KW
CENTRAL FURNACES AVG. FOR 7 CUST
UNIT HEATERS AVG. FOR 15 CUST
TIME OF SYSTEM ANNUAL PEAK
DEMAND PER CUSTOMER - KW
NOON

PLATE II

Curves for heating load only covering the same day as shown for total load by Plate I.

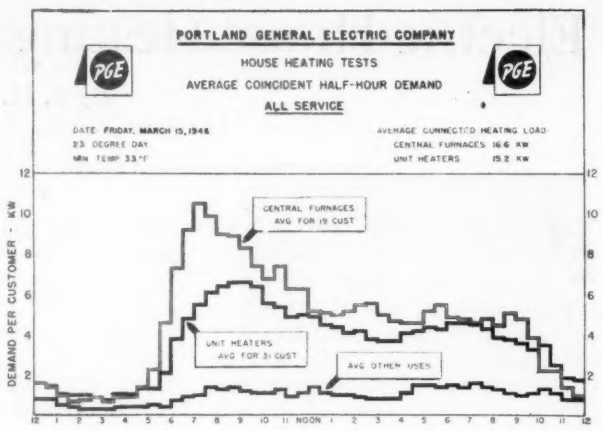


PLATE III

The two upper curves indicate total load including heating for each of two methods of electric house-heating. The lowest of the three curves is the ordinary residential use before space-heating, at 100% range and water heater saturation. These curves are included to give a comparison in load curve for the heavy heating period in December (see Plate I) and the relatively lighter heating period in March.

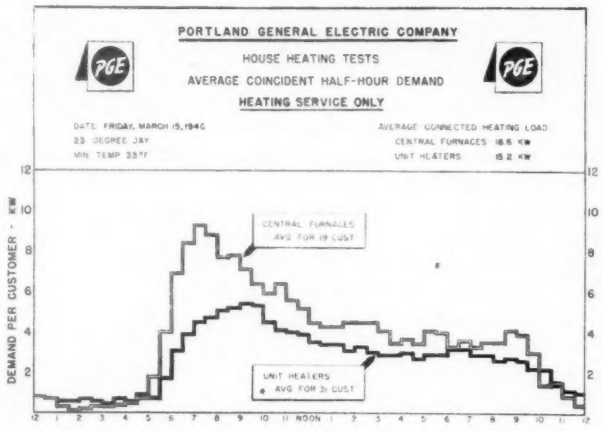

PORTLAND GENERAL ELECTRIC COMPANY
HOUSE HEATING TESTS
AVERAGE COINCIDENT HALF-HOUR DEMAND
HEATING SERVICE ONLY
DATE: FRIDAY, MARCH 15, 1946
23 DEGREE DAY
MIN. TEMP 33 °F
AVERAGE CONNECTED HEATING LOAD
CENTRAL FURNACES 16.6 KW
UNIT HEATERS 15.2 KW
CENTRAL FURNACES AVG. FOR 19 CUST
UNIT HEATERS AVG. FOR 31 CUST
DEMAND PER CUSTOMER - KW
NOON

PLATE IV

Curves for heating load only covering the same day as shown for total load by Plate III.

ing load over a full 12-month period. Objectives of the test primarily were to determine (1) the load and diversity characteristics of electric heating, (2) power costs, and (3) distribution costs. Secondarily, we desired to determine the variations in load characteristics between the two basic types of heating installations commonly used on our lines, and the effect of certain operation methods on economy such as the practice of keeping the home reasonably warm during the night.

From the primary data we shall be able to derive a new house heating rate that will cover our costs plus a reasonable return on investment. As an interim measure pending the outcome of present investigations, the Company last November made effective a new all-electric residential schedule offering customers having ranges and water heaters substantial savings and allowing unlimited house heating subject to a demand charge assessment for demands in excess of 10 kilowatts.

To describe our test methods very briefly, two recording demand watt-hour meters and required current transformers are being installed in each of the 75 test homes selected, one of the instruments recording the total load in the home and the other the heating load separately. Composite curve data is then developed from the meter charts. Some delay in obtaining instruments has been experienced, with the result that tests were obtained on only 18 of the 75 selected residences during December of last year when the minimum temperatures for the winter occurred. Fifty-eight of the residences were under test by the end of March, and as additional meters are obtained it is planned to continue the tests for each home through a full 12-month period.

The two heating methods in general use are unit resistance heaters thermostatically controlled in each room, heating by a combination of radiation and convection, and central warm air furnaces heating through ducts by forced convection, also thermostatically controlled. Curves are being developed for each type. These curves seem to indicate fairly positively that the peaks and energy consumed have consistently been less for unit heater systems than for central furnaces. The composite demand mea-

(*Continued on page* 236)

Electric House Heating in the South

By J. M. Barry
Vice-President, Alabama Power Company

Address before the Annual Meeting of the Edison Electric Institute, New York, N. Y., June 5, 1946

THE possibility of heating houses by electricity has wide appeal. Electric heat is clean and it is quickly available. It is easy to regulate. It is not necessary to provide room for a furnace and fuel storage. Chimneys can be eliminated, and space otherwise conserved.

Consumers of electricity have observed an ever-widening use of electricity over the years at steadily decreasing cost per kwhr. This greater use has resulted from a progressively wider acceptance of major appliances—ranges, refrigerators, and water heaters, better lighting, and many other uses. The public is keenly conscious of the contribution which electricity has made to better living, and it realizes that these advantages have come at very little increase over the years in the monthly electric bill; indeed, at a lower competitive cost for complete household services. It seems only natural that the public should look forward to the next major steps in expanded use of electricity in the home—house heating and air conditioning. In my opinion, these developments will come along more slowly; much ground must first be broken.

It seems to me that economic factors and competitive considerations will influence the general use of electricity for house heating to a greater extent than they did the range, refrigerator, and water heater. One reason for this is that much greater quantities of electricity, and higher demands, with much larger monthly billings, are involved. Electric house heating will have to be closely competitive with other fuels to be accepted; and it is the task of the utility industry to examine if this is economically possible. In expressing an opinion on the subject, I should say that it is based on insufficient and incomplete data on the characertistics of actual installations.

It seems to me that in the present state of the art, the conversion of electricity into heat—purely for use in heating the air in a house—economically has "two strikes" against it. Assuming that the energy comes from a modern steam plant, the electric energy output of the plant would be about 30 per cent of the energy in the fuel. By the time this energy reaches the consumer on the distribution system, the equivalent figure would be about 25 per cent. Thus, there has been lost about three-fourths of the energy in the fuel, which must be recovered in some way if electricity is to be made competitive for house heating. Relatively higher cost of fuel to the householder will restore only in part the competitive position of electricity. Moreover, these observations do not take into consideration operating expenses and fixed charges on production, transmission and distribution facilities I am aware, of course, that the availability of large quantities of hydroelectric power at very low city-gate rates could affect these considerations.

In order to get a cross-section of opinion and actual results of house heating in the Southeast, the Southeastern Electric Exchange sent out an inquiry to many of the principal utility companies in our part of the country. The results of this inquiry show that, except for two or three experimental installations, electricity for general house heating is not being promoted by the companies. Nearly all companies reported the use of auxiliary room heaters in sizes varying from 500 to 3000 watts. No special rates are offered for the latter type of service. These uses are justified on a basis of their special convenience. In addition to the results of his survey, it should be reported that distributors of TVA power throughout the Tennessee Valley were in 1944 serving about 1000 electrically heated homes.*

On a strictly competitive cost basis for varying fuel prices effective throughout the area, the equivalent electric rate would have to be from 2.0 to 3.5 mills per kwhr. Advantages of electric heat, already mentioned, would justify a somewhat higher price for electricity than this, but the spread is still too great for electricity to be broadly competitive.

A good many of the utilities in the southern part of the country have already felt, or will soon feel, the impact of summer air conditioning. Even before the war, peaks of some of these utilities shifted to the summer as a result of air conditioning and refrigeration loads. The summer air conditioning load will continue to grow rapidly, presenting a serious problem to the utility companies. Up to the present time the companies with which I am associated have, however, had very little experience with summer residential air conditioning, but there is no question of the large potentialities of this type of load.

From the meager data available, it appears that the diversified annual load factor of residential summer cooling will be about 5 per cent. On the other hand, a combination of winter heating and summer cooling may have a diversified annual load factor as high as 25 per cent, if such service can be accomplished with the heat pump. These conditions have prompted some of our utilities in the Southeast to sponsor a research program to explore the possibilities in this field. As announced in March, a contract has been made between the Southeastern Electric Exchange and Southern Research Institute of Birmingham to survey the present status of heat pump development, the plans of manufacturers for its future, the activities of the utilities in this field and their plans for promoting its use. The research staff of the Institute will also compile such practical and theoretical information as may be necessary for evaluating the application of the heat pump to our situation in the Southeast particularly, and will obtain actual performance data on current installations and sample heat pumps obtained from at least two manufacturers. You are already familiar with the pioneer work on the heat pump of Philip Sporn and others. These efforts will doubtless be continued. Mr. Sporn has recently suggested that in order to gain experience, an order for 1000 units built according to an agreed specification be placed with a reputable manufacturer, commitments for these units to be made by electric companies throughout the country.

We believe that the heat pump for

* Electrically Heated Homes in the Tennessee Valley, Buford H. Martin. *Electrical Engineering*, December, 1944, p. 437.

year-round air conditioning (summer cooling plus winter heating) could be made competitive, service considered, with coal, oil, and natural gas in the South at rate levels between 1c and 2c per kwhr. At what level a utility company can afford to sell electricity for such service is another question. Even taking the 25 per cent annual diversified load factor said to be possible for year-around heating and cooling with a heat pump, a kilowatt load at that annual load factor would, at a 1c rate, produce only $21.90 revenue. If the energy component of cost is taken at 3 mills per kwhr, there would be left only $15.33 to cover the annual demand component of cost per kilowatt. This amount is not sufficient to cover in full all other costs of delivery to a residential customer on a distribution system. It is my opinion, therefore, that a rate of 1c per kwhr would be inadequate if we look ahead to substantial saturations of such 25 per cent load factor residential loads.

It is estimated that nearly a million new homes will be built in the South within the next decade and that over 30 per cent of these homes may be considered as active prospects for air conditioning. As these homes should also be prospects for electric heating as well as cooling, the job ahead of us is obvious.

It is not desirable, in my opinion, to attempt to sell electric power for house heating unless the advantages of such service will be so evaluated by the customer that he will be satisfied without unduly preferential rates. With these considerations in mind, we conclude that the only way to make electric house heating practical in our area is to develop the heat pump to improve its coefficient of performance and otherwise perfect it for the dual job of summer cooling and winter heating; and to make its application economically feasible. Therefore, it seems to me that we should, as an industry, actively work toward these ends.

Conclusion

1. In the Southeast, electric house heating with resistance units is generally not competitive with other fuels.

2. Year-round air conditioning (summer cooling plus winter heating) using the heat pump, is feasible in certain parts of the Southeast at rate levels between 1c and 2c per kwhr.

3. There is apparently a large potential market for the heat pump in the Southeast.

4. Before the heat pump is actively promoted and generally accepted in our part of the country, much research remains to be done to determine the economics of using this appliance for electric heating and cooling, both from the standpoint of the utility company and of the consumer. The utility must determine the effect of this load on its costs to be sure that it is not loading up its system with unprofitable business. The consumer must be able to buy reliable equipment at prices, considering convenience and advantages, which he considers competitive with equipment using other fuels; and must be willing to buy electricity at a price which yields a fair return to the utility.

Electric House Heating in Pacific Northwest

(*Continued from page 234*)

sured at the customer's meter at the time of the system peak on December 20 of last year averaged 6.4 kilowatts for central furnaces and 5.3 kilowatts for unit heater systems.

Also fairly conclusively demonstrated from the data so far at hand is the fact that the cost of power to serve a heating load, under the present kilowatt-year rate at which we presently must purchase Federally-generated power from Bonneville Power Administration, approximates 8½ mills. To this we must add our distribution cost, yet to be determined from our present experimentation. Obviously a resale rate for consumers generated from these costs certainly cannot be lower than the interim schedule now effective (which averages out at approximately 9½ mills) unless the basic conflict between the highly seasonal nature of electric house heating load and the kilowatt-year rate for Federal energy is resolved by a satisfactory modification of the Government's whole rate structure.

The Bonneville administration is aware of this problem and has advised the Company that it is working out a more favorable rate for energy which distributing agencies can resell to house heating customers. They have advised us informally that they have in mind a straight kwhr rate of 4½ mills.

As soon as our studies have progressed sufficiently to determine accurately our distribution costs, we plan to file a permanent rate for full electric house heating that will cover all costs of service to this load plus a reasonable return. This will probably be a separately metered rate and provision for such metering has been made in the present interim tariff. If the permanent rate is higher than the present one, we plan to request a public hearing before the Public Utilities Commissioner of Oregon so that all the facts, including the cost of power from Bonneville, will be brought into the open and made a matter of public record.

I want also to make it plain that any data on electric house heating which we gather as our tests continue is available to the industry, and we shall be glad to give full attention to any inquiries you make now or later.

Electrically Heated Home Served by Portland General Electric Company
Volume 12,600 cubic feet—Connected heating load—19 kw.

Postwar Labor Trends

By H. K. Breckenridge
Assistant to the President, West Penn Power Company

Address before the Annual Meeting of the Edison Electric Institute, New York, N. Y., June 5, 1946

THE SURRENDER of Japan was hardly out of the headlines before the big news was strikes, strike threats, new wage-price policies, and other labor pains for our national economy.

The many wartime restrictions affecting labor and management resulted in an accumulation of pressures which reached the boiling point almost immediately when the shooting stopped.

We all know what happened—

Every one wanted controls off as fast as possible;

Every one recognized there would be reconversion difficulties;

Every one agreed that abundant production of peacetime goods—and quickly—was the salvation of our economy, and of the world.

It was easy to agree on broad objectives but, as usual, serious disagreements arose as to the methods to be used.

Our government economists guessed wrong on the difficulties of reconversion—they envisaged more unemployment and greater cuts in workers' take-home pay than actually took place. Mixing some politics with economics—they talked about big wage increases in industry with little or no effect on prices. Such encouragement was all that organized labor needed to make a determined drive for very sizeable wage increases.

It's always easier for a government which is responsive to the voters to give way to inflationary demands than to "hold the line." The inevitable result was a so-called "pattern" of wage increases, advocated by government, of a size which could not help but have a major effect on the nation's price structure.

The difficulties of trying to have a "managed economy" were never more clearly illustrated than in our present situation where one branch of government actually encourages large wage increases, while another branch tries to minimize the effect of the wage increases on prices. The results have delayed reconversion, which started so much better than had been forecast, and have seriously interfered with the high level of production which we all know is our greatest need and only salvation.

Against this background, let's see how our Industry has fared in the reconversion.

Electric utilities have been fortunate in many ways.

Most companies had expanding employment opportunities. They could absorb all their own veterans and employ others, due to the return to the 40-hour week, to pent-up demand for construction of line extensions, and to expansion of sales activities.

Our industry was not overexpanded in its facilities, and hence did not have to curtail operations greatly; nor did we have to change the kind of product we make.

These facts have been important and helpful in their effect on the morale of electric utility employees, and have helped our labor relations to be better than those in industries more seriously affected by the impact of reconversion.

However, we have felt the effects of many national labor trends. Let's take a look at some of the more important ones which affect our industry, including: higher wage levels, strikes and threats of strikes, and increased unionization of utility employees, including foremen.

Higher Wage Levels

Our industry has been characterized by generally good levels of wages and by very stable employment. In the reconversion period there have had to be fewer cutbacks in working hours, and therefore less reduction in take-home pay than in many other industries. For these reasons the increases in wage levels in our industry since V-J Day, while substantial, have not been as great as the national wage patterns established in the oil, steel, or automotive industries.

A recent survey covering 80 per cent of the total employes in our industry showed a range of increases, since V-J Day, from a low of two cents to a high of 19c. per hour. The most frequently-occurring increase was 14c., and the weighted average was about 12.25c. The survey reflected the fact that the increases were made under a variety of local conditions and were influenced by such considerations as:

Increases made previously, especially since 1941;

Relationship with wages in other industries;

Whether or not a cutback in working hours was involved.

No national pattern of wage increases has been established by action of the National Wage Stabilization Board, and from the record of wage increases made by electric utility companies since V-J Day, it would be difficult to prove that any consistent pattern exists.

The nearest approach to a national pattern in our industry is the substantial number of 15c. general increases negotiated by a majority of C.I.O. Unions, and by some A. F. of L. Unions. An analysis of the increases made which were higher than 15c. indicates that they usually included such special considerations as:

Increases for job evaluation plans;

Increases in lieu of "fringe" adjustments such as increased vacations, sick pay, etc.; or

Increases necessary to bring the total up to 33 per cent since January, 1941.

Strikes and Strike Threats

The strikes and strike threats in our industry have posed some serious problems of policy for labor leaders, utility managements, and for government authorities.

Neither labor nor management wants to be deprived of freedom to bargain, which also means freedom to resist unreasonable demands. Yet the public dependence on our service is so great, and power facilities affect so many essential parts of every one's daily life, that a shutdown for any period of time will not be tolerated by our customers.

Already we have seen enacted into law the principle that if labor and management cannot agree through collective

bargaining, and cannot find a way to settle their differences, the government must step in and provide a way to settle the dispute without permitting any shutdown of utility service.

A recent Gallup Poll revealed that 64 per cent of the public approves a law to forbid utility strikes. New Jersey's new law providing the rules for collective bargaining in utility companies, and providing that the Governor may seize the company property in the event of a strike or threat of a strike, probably reflects pretty well what the public thinks should be done.

The law has had one test so far, in a dispute involving the Gas Company employes of Public Service Gas & Electric Company. Seizure by the Governor proved to be an effective spur to prompt settlement, and the provisions of the law for government fact-finding did not have to be used.

At this point we can only speculate on whether the law will meet tests of its constitutionality, whether it can be effective in cases involving strong national unions, and whether it will work in a case of serious rank-and-file belligerence.

Since it is new and might act as a pattern in other states, it is well to look at some of the New Jersey law's provisions.

One provision is, "the majority of any craft or class of employes shall have the right to determine who shall be the representative of the craft or class for the purposes of this Act." This seems to promote *craft* organization of utility employes, which is opposed to all trends by both A. F. of L. and C.I.O. Unions, which normally organize our industry on broad industrial lines.

The law requires that agreements be in writing, for periods of not less than one year; and it requires advance notice of any changes proposed in contracts at their expiration, not only to the other party but also to the State Board of Mediation. This provision is apparently intended to keep the State authorities in touch with collective bargaining from the beginning, and therefore able to anticipate difficult disputes and to know their background if an impasse is reached.

In defining "collective bargaining," the law states: "The term 'collective bargaining' . . . shall include the right of representatives of employe units to be consulted, and to bargain upon the exceptional as well as the routine wages, hours, rules, and working conditions." It is apparently the intent that there shall be virtually no limits to matters upon which employers and unions must bargain under the law.

In furtherance of this philosophy, the law provides: "Whenever . . . a situation exists in any utility whereby employes are rendering services under terms and conditions . . . *which have not heretofore been the subject of the contract,* and said employes desire to effectuate a change in the terms of employment, or a utility desires to effectuate a change in said terms of employment, then and in that event it shall be the duty of the parties desiring such change, not less than 60 days prior to the desired effective date thereof, to inform the other party in writing of the specific changes so desired, and the manner in which they are desired, either by written contract or otherwise, and to file a copy of such terms with the State Board of Mediation."

Collective bargaining has normally been limited to matters covered by the union-management agreement. Under this law, however, any change in terms of employment, whether or not previously considered a matter for bargaining, is expressly made subject to the collective bargaining process.

Finally, the law provides that if no agreement is reached, and there is no agreement to arbitrate, the dispute must go to a panel for public hearing. The panel files a report and submits recommendations to the Governor. If either party fails to accept the recommendations, the Governor may seize the property and operate it pending a settlement, after which he must return it as soon as practicable.

A study of New Jersey's new law shows that it is not what either employers or unions want. Collective bargaining under the shadow of government compulsion or coercion toward either side is not likely to promote good will between men and management, and an agreement dictated by a fact-finding board is very likely to be unsatisfactory to both parties. Experienced labor relations men agree that a negotiated agreement made directly between the interested parties has a much better chance of being the basis for a successful relationship than any agreement dictated by a third party.

In our industry, however, we have to ask ourselves the question—"What do we do if we can't reach an agreement with our employes?"

The public says that we can't settle matters with a strike—that seems to be the real force back of New Jersey's law. However much we may regret it, we therefore have to think carefully about what method of settlement will be preferable in case we reach an impasse in bargaining. These points seem clear:

1. Both parties should try their best to reach an agreement without resort to a third party. Every incentive of law and of collective bargaining should point to that end.

2. If bargaining breaks down, the alternatives seem to be:

a. Mediation by state or federal agencies.

b. Fact-finding.

c. Voluntary arbitration.

In the field of mediation there are usually available both State and Federal Labor Department conciliators. These men are frequently experienced and able, and can bring to a conference the advantages of an outside point of view. Unfortunately, all conciliators are not of high caliber, and frequently were chosen because of their background of labor union associations. In such cases managements can hardly have confidence that the conciliator's recommendations will be without bias or that "off the record" confidences will be respected.

The mediation process has the advantage of involving no commitments by either managements or unions to accept suggestions of conciliators, and often the removal of bargaining to the State or National Capitol proves helpful if local feelings are running high. A further advantage is that government officials are well informed of progress in negotiations and attitudes of both sides. This should prove advantageous if public authorities have to take action to preserve order in case a strike or strike threat develops.

Fact-finding is an intermediate technique between conciliation and arbitration. The fact-finding board studies the case, hears evidence, and makes a report and recommendation. Neither party to the dispute agrees in advance to accept the recommendations, but rejection of them is almost certain to involve loss of public support for the rejecting party.

Voluntary arbitration involves the acceptance by both parties, in advance, of the findings of the arbitration board. Agreement to arbitrate pleases the public because it is mainly interested that there be no strike, and the arbitration process is popularly looked upon as a fair way to settle disputes.

Both fact-finding and arbitration depend for their success on the men who

are selected to be the neutral members of the boards. To be successful they must be men familiar with our special industry problem; they must be familiar with the background of labor relations in our industry, and be able to give special consideration to the background of local labor relations; they must also have the confidence of both labor and management that their decisions will be based on the facts of the case and not on personal bias or preconceived theory. The difficulty of meeting such specifications is obvious, but since the public won't stand for strikes, both management and labor in utility companies need to do all they possibly can to find the right kind of men on whom they can call for arbitration if necessary.

Unionization of Electric Utility Employes

A recent survey covering over 80 per cent of employes in the industry showed that about 76 per cent are represented by unions. These are distributed as follows: 38 per cent A. F. of L. (including I.B.E.W., I.O.E., and District 50); 22 per cent C.I.O. (U.W.U. of A.); 16 per cent Independent Unions; 24 per cent No Union.

No accurate figures are available for pre-war comparison, but there is no doubt that unions have made substantial gains during the war.

Most recent trends have been the large gain in membership by the Utility Workers Union of America when that union took over the membership of the Independent Union in the Consolidated Edison Company of New York City. Up to that time more employes of electric utilities were represented by independent unions than by the C.I.O.

In looking ahead to future collective bargaining problems, it is interesting to note some of the actions taken at the recent Convention of the Utility Workers Union of America, C.I.O.:

1. The seriousness of strikes in electric utilities was recognized. A suggestion was made that clerical and non-production workers be called out, but workers essential to supplying power stay on the job.

2. All contracts must provide for ratification by local membership, and must be signed by representative of the National Union.

3. Supervisors were made eligible for membership, subject to approval of the National Union. Supervisors are considered a new field for organization activities.

4. One of the objectives of the Union is to attain greater standardization of wages and working conditions.

5. Uniform Contract termination dates are favored.

6. The Union proposes to campaign for labor representatives on Public Utility Commissions.

7. The Union opposes job evaluation plans as "pseudo-scientific arrangements for circumventing collective bargaining."

8. The Union voted to bar from membership any one belonging to Communist, Fascist, or Nazi organizations. It was the first C.I.O. Union to make such a provision part of its Constitution.

In interesting contrast to this Union's action was the action of the United Public Workers, C.I.O., who at their recent Convention opposed all resolutions condemning Communists or Fascists. This Union might be one which would include employes of publicly-owned utilities.

The objectives of the U.W.U. of A. seem to be in the direction of more control over local unions by the National, and toward uniform contract dates, both of which policies show a leaning toward industry-wide bargaining.

Managements have not looked with favor on any trend toward industry-wide bargaining, and I believe that unions should consider the greater advantages which accrue from locally-made agreements. What both management and labor should be working for is the agreement which will *work best*. That means an agreement which gives full consideration to local problems, and which is *understood* by both local management and local union members.

There have been examples within recent months where an agreement was reached with National Union Officers, and where that agreement did not prove fully acceptable to the locals back home. The signed agreement is only the first step in the company-union relationship. The important thing is to have it accepted wholeheartedly by both employes and supervisors as a sound basis for the day-to-day operations of the company. Agreements which are made by local union committees with local company management have a much better chance of meeting local needs, of being better understood by those who work under them, and therefore being agreements which contribute to good employe-management relations.

Unionization of Foremen

An important change in national policy occurred last year when the National Labor Relations Board reversed its previous decisions and determined that foremen had the right to join unions and bargain collectively with management. Subsequent decisions by the N.L.R.B. have indicated that foremen will be permitted to belong to the same union as the employes they supervise. It is not yet clear where the N.L.R.B. will draw any clearly-defined line as between management and men. There have been a few decisions on this important matter in cases involving our industry, notably a recent case involving the Potomac Electric Power Company of Washington, D. C.

The policy of the N.L.R.B. clearly permits the unionization of at least the lower levels of supervision. This policy is being challenged in the courts, but unless the Supreme Court overrules the N.L.R.B., or unless Congress should pass legislation eliminating supervisors from unions, the possibility is open for any management to find itself bargaining with a large number of its employes who have heretofore been considered a part of management.

The difficulties for management resulting from supervisors in unions are many. While management is apparently responsible for seeing that no unfair labor practice is committed by supervisors, yet certainly a supervisor will be a partisan for his own union in any conflict between unions. It is difficult to see how supervisors who are normally consulted in determining labor relations policy, and who have serious responsibilities in carrying out labor relations policies, can effectively discharge their duties if, in doing so, their actions are distasteful to the large majority of the rank-and-file union of which they may be a part. The problem of maintaining effective discipline and getting production from workers will certainly become much more difficult if supervisors are part of a rank-and-file union. The unionization of supervisors in the electric utility industry has not proceeded to any marked extent. Thoughtful managements are giving consideration to what advantages, if any, unions have to offer to their supervisors, asking themselves such questions as:

Are salary differentials reasonable and fair?

Is overtime properly considered in determining wage levels?

Are supervisors given appropriate training?

Are supervisors kept informed of management policies and given an oppor-

tunity to participate in the development of such policies?

Conclusions

Although the electric utility industry has not had as much labor difficulty as many other industries since V-J Day, we have felt the effects of many current labor trends which pose new problems for utility managements. More unions in our industry mean increased collective bargaining problems. Strike threats mean that both managements and unions must find a better, but still fair, way to settle their disputes without interruption of service to our customers. Higher wage rates make it more than ever necessary that we increase operating efficiency and keep labor productivity at the highest possible level.

Our industry is meeting these problems in several ways:

First, we are increasingly better informed on employe relations matters within our industry. Recognizing that too often the national unions with which we deal are better informed than the company representatives at the bargaining table, the Edison Electric Institute Industrial Relations Committee has continued to sponsor interchange of information on employe-relations matters both through informal meetings and through questionnaires. Efforts are now being made to establish a close liaison with regional associations of electric utility companies where they are meeting and discussing labor-relations matters.

Second, our industry has recognized the growing importance of labor relations through the development of more effective Industrial Relations Departments. In general, industrial relations staffs conduct research, advice on policy, participate in collective bargaining, and carry out many phases of personnel programs. The importance of a sound employe-relations program has outgrown the days when these functions can be only a part-time job of an otherwise busy executive. At the same time, all operating executives are being made increasingly aware of the importance of good employe relations in the conduct of their jobs. The employment of specialists to work in the industrial relations field exclusively should in no way minimize the responsibility of every supervisor for conducting his part of the job of building good relations between men and management with both union and non-union employes.

Third, and most important, is the recognition that the key to most of our labor problems lies in the continual building of sound employe-management relations. The importance of good employe relations has long been recognized in our industry, and it has never been of greater importance than it is today. A satisfied, cooperative employe working under a supervisor who has earned the respect and cooperation of his men will give his company full value for today's higher wage levels. A dissatisfied employe will be costly to his company even though he is paid a much lower wage. Careful selection of new employes, proper training for their jobs, fair wage and salary administration, adequate welfare and health programs—these and many other personnel techniques have been used for years and are more than ever essential to good management.

In the electric utility business, where we are dependent upon the good-will of our customers if we are to continue in business free from political management, we have a tremendous stake in seeing that we overlook no opportunity to insure that our employes feel their company is soundly managed, has progressive policies, and is interested in the welfare of all its workers. To the extent we do this, we need have no fear of either today's or tomorrow's labor trends.

Objectives of Better Light-Better Sight Bureau Described by Restofski

OVER 15,000,000 pieces of educational material have been distributed on the Better Light-Better Sight program, since the organization of the Better Light-Better Sight Bureau in 1934, Harry Restofski Bureau Chairman, stated in a recent speech to the lighting Industry Round Table. Over 200 varied items, such as booklets, folders, films, newspaper advertisements, displays and radio talks are represented in this total, Mr. Restofski said.

The Bureau is the oldest national program in the electrical industry, Mr. Restofski continued. Its successful operation throughout the war years, when most cooperative activities ceased, is a tribute to the basic soundness of its educational approach to the subject of Better Light for Better Sight, he declared.

The aims and objectives of the Bureau have not changed since its formation, he said. Reviewing its history, Mr. Restofski explained that the Bureau was founded to help eliminate inadequate lighting, one of the main causes contributing to defective vision, by coordinating the promotional work of electric companies, lighting equipment manufacturers, the paint industry and optical interests, and assisting these organizations to use the educational approach in their own respective programs.

A large organization was not visualized, Mr. Restofski noted, saying that the plan called for the Bureau to function as a stimulant to the various industry groups, without direct contact with the public. In this way, the Bureau could more easily continue its operation over the extended period which would be necessary to change successfully the thinking and habits of the public. The judgment of the founders has been completely vindicated, he said.

Some of the Bureau's contributions to better appreciation of the importance of good lighting were listed by Mr. Restofski, who mentioned the numerous articles appearing in medical journals on eye conservation. These, he said, were partly the result of the Bureau's distribution of data made available by lighting societies and scientists.

Emphasis placed by the paint industry in its advertising on the partnership of good lighting and good reflecting surfaces in creating better seeing conditions, and activities of groups such as safety councils and insurance companies on good lighting for proper seeing, are partly due to the Better Light for Better Sight Program being constantly kept before them, he declared.

An outstanding national organization of educators recently produced a teacher's manual, on the relationship between light and sight, which was inspired by the Bureau, Mr. Restofski said. This manual will affect hundreds of thousands of pupils, and may develop into one of the most important steps ever taken in the broad field of lighting education, he said.

Present activities of the Bureau brief-

(*Continued on page* 256)

Progress Toward Income Tax Equality

By B. C. McCabe

President, National Tax Equality Association

Address before the Annual Meeting of the Edison Electric Institute, New York, N. Y., June 5, 1946

TWO years ago when I met with you I was able to tell you a story of tax-exempt competition that, as I recall, shocked and appalled you all. The story that I shall tell you today is both infinitely worse and infinitely better.

It is worse because the inroads of the tax-exempt businesses have become more intense and more violent; because the volume of tax-exempt business has increased tremendously, and because the plans of those of our competitors who pay no Federal income tax are so much bigger and bolder.

It is better because we believe we are approaching a show-down in which we shall win, and the tax equality for which we have been fighting will become an actuality.

I bring you a report of progress. It is, in the main, encouraging. In the two and a half years that the organization of which I am President, the National Tax Equality Association, has been in existence, we have broken through the shell of mystery and pseudo goodness which has surrounded the cooperative movement in this country for 50 to 100 years. We have made the income tax evasion of certain elements of business a by-word of shame and opprobrium in the minds of hundreds of thousands of businessmen over the United States. We have made the subject of tax equality a national issue—one of the hottest issues that is now before the Congress.

Before I go further, let me correct for you some of the errors that I have found in the talk I made to you two years ago. They were not errors of fact as we knew the facts at that time. They were errors only because we didn't know all there was to know, and because the subject is so complex that all of its ramifications may never be known.

I said to you then that cooperation was doing almost $4 billion in volume a year. The figure for 1945 was $12 billion.

I listed as the enterprises in which cooperatives were engaged the operation of grain elevators, flour mills, coal and lumber yards, packing houses, stores, printing plants, newspapers, telephone companies, banks, insurance companies, undertaking establishments, farm machinery factories, and petroleum drilling and refining.

I should now like to add to that list electric appliances, railroads, lipstick, rouge in five seductive shades, face creams, face powders, hair tonic, soap flakes, vitamin pills, cigars, cigarettes, pipe tobacco, groceries, theatres, hospitals, radio broadcasting, the building of houses, meat packing, life insurance, the operation of bus lines—and even then I have by no means named all. Among other possible additions to the list, Walter P. Reuther, new president of CIO's United Automobile Workers, is proposing to establish labor-owned producer-worker cooperatives which will manufacture prefabricated houses, railway equipment, farm machinery and electric appliances.

I find in looking over my old manuscript that I submitted with some degree of horror the possibility that our national post-war budget would be $20 billion a year. It is nearly twice that.

I find that I stated the net worth of the Farmers Union Grain Terminal Association of St. Paul as $4,300,000 after six years of operation. It is today over $9,000,000.

Yes, cooperation is growing. It is growing by leaps and bounds, and even a cursory examination of the boastful co-op press discloses plans for greater and more rapid growth in the future.

Consumers Cooperative Association, of Kansas City, which is primarily in the oil business, has recently announced plans to increase its volume of business four times in the next five years—to $104,000,000 a year. The Pacific Supply Co-op, of Walla Walla, Washington, says it will treble its business by 1950—to $25,000,000.

The Farmers Union Central Exchange, of St. Paul, at its annual meeting in March of this year, approved plans to expand net worth from $5 million to $10 million, and then quickly from $10 million to $20 million, and the general manager stated to his stockholders, "If we can just lick NTEA you won't have to take a penny out of your pockets to do it." In other words, you and I and all other taxpayers will foot the bill!

These are just three out of many—and all of them are growing and planning to expand still further out of Federal income tax avoidance. The rest of us, they seem to assume, will pay the war debt, maintain a couple of million Federal employees, pay for an Army and a Navy to protect them, dig down into our pockets for loans to the rest of the world, and put enough money into the Treasury to finance co-op loans and the building of new public electric projects.

You can easily see that the electric industry is not alone today in trying to save its life. All business is in the same boat. And all business must now recognize the immediate need of getting together to combat a situation that is rapidly coming to the point of desperation.

Fortunately, business is recognizing the need for action. All over the United States there are springing up new local organizations of businessmen whose primary purpose is to demand and to get equality of taxation. They are working for you. But because they are also working for themselves, with a strong self-interest in the preservation of their existence, they will be tremendously effective.

Just recently I have heard of a new organization in Oregon—the Northwest Electric Appliance Dealers Association—which has been set up to combat the imminent invasion of their business by co-operatives. We knew nothing whatsoever about it until statewide organization had been perfected, officers had been elected, a manager had been employed and their campaign was under way.

The formation of this group is a fine demonstration of the old law of self preservation at work. The Pacific Supply Cooperative, one of the members and owners of National Cooperatives, Inc.,

of Chicago, had begun to advertise—as other members of National are advertising in other parts of the country—"Wait for co-op appliances which will soon be on the market," with the bait of patronage dividends to reduce prices.

The Oregon group acted rapidly. Without even knowing that a national organization was also fighting the battle, these Oregon appliance dealers rolled up their sleeves, went to work, and all on their own instigated a demand for tax equality as the solution of their problem.

They are not alone. Small businessmen in other parts of the country are organizing in just the same way. The powerful Smaller Business Association of New England, Inc.—a group that came into existence several years ago—investigated the growth of competitive cooperatives in the six Northeastern states and uncovered facts so terrifying to them that they immediately passed a resolution demanding that Congress end this intolerable situation.

In Tennessee, small businessmen formed a Citizens' Committee with the chief purpose of insisting that Federal income tax inequalities be abolished at once.

In nearly three dozen states similar action has recently been taken, and inasmuch as these are largely political groups organized at the grass roots for the express purpose of bringing the situation to the attention of Congress, it is fair to assume that action will result.

Small business is one of your most powerful allies in this fight—an ally that you should cultivate assiduously at all times. Small businessmen are numerous—it is estimated that there are 7 million of them over the United States. They are being hurt seriously by cooperatives, which are setting up businesses on Main Street and selling all manner of goods in direct competition—income tax free. Small businessmen are high taxpayers—in many instances their rates today are higher than those of corporations, and they must pay on every dollar they earn whether they take it out of the business or leave it in for growth and expansion.

Right now, small businessmen throughout the Nation are outraged by the ridiculously unfair report which was submitted to Congress a few weeks ago by the House Small Business Committee—the Patman Committee.

That report, as you may have read, attempted to whitewash the co-operatives. It said, for instance, that Federal income tax exemption gave the co-ops very little advantage over their taxpaying competitors—though regular corporations paid into the Treasury an average of 65 per cent of their earnings during the war and are paying 38 per cent right now, while the co-ops pay little or nothing. That strikes me as a tremendous advantage.

The Patman report said that cooperative volume of business is merely nominal—but neither you nor I nor any other business man would look upon $12 billion as peanuts.

It said that cooperatives operated as a successful means of combating monopolistic concentrations, but the fact of the matter is—and the Patman committee could have learned it from official figures, just as our own Research Department did—that in many instances cooperatives themselves are rapidly trending toward monopoly operation. I submit to you that a cooperative monopoly will prove to be no healthier for the Nation than any other kind of monopoly.

Those are just some of the silly misstatements of this Patman Committee report on cooperatives. Quite naturally, the cooperatives are making the most of them. The report is, they are saying, official proof of their goodness and their holiness. There is, they gleefully assert, no need for Congress to look further into the matter.

But the pay-off is yet to come. Businessmen the Nation over, who have looked upon this House Small Business Committee as the earnest defender of their interests, are pouring upon Congress such a volume of heated letters as to make the members of the committee wish they had never been born.

Minority members of the committee are promising to write and publish a dissenting report, based on actual facts and not on guesswork and biased opinion.

Congressman Ploeser of Missouri wrote to a complaining constituent: "Please don't take out your wrath on me. I, too, am a businessman and do not like the cooperative competition of private enterprise. I think all should be taxed equally. That's why I insisted on the emphasis in this Report that there was nothing conclusive about it. I will support any program which will bring about tax equalization."

And Congressman Howell of Illinois added this significant paragraph in a letter which he wrote: "As you will note from the letterhead on which this letter is written, the Small Business Committee is composed of five Democratic and four Republican members, and consequently the report should be regarded as an expression of the Majority members, or the New Deal Democrats."

We recommend that you pay not too much attention to the report of the Patman Committee. From all we hear, the Congress itself is very little impressed by the attempted whitewash, and we can be very sure that the Ways and Means Committee, which must originate legislation to correct existing tax inequalities, will make its own decisions.

Far better than I, you know that if a little cooperative group of electric users can get away with erecting poles and securing customers, without franchise, in the city of Salem, Oregon, they will surely try it elsewhere. And if The Dalles in Oregon and Yakima in Washington also go into this type of cooperative electric operation—serving the druggist, the jeweler, the dentist, the lawyer and other proponents of public power—we are likely to see a rash of electric cooperatives springing up in cities wherever they can hitch their lines to public power, and creating still a new type of tax-exempt competition.

I often wonder what manner of public officials we taxpayers are supporting when they interpret "farm supplies and equipment"—the words used in Section 101 of the Internal Revenue Code—to include not only electric toasters and television sets but vitamin pills, soap flakes, face creams, hair tonic, sanitary napkins, lipstick, cigars, cigarettes, pipe tobacco, funerals, bus lines, railroads and complete homes.

Under just what authority of law did Treasury officials recently advise Melvyn Douglas, the motion picture actor and husband of Congresswoman Helen Gahagan Douglas of Hollywood, that he could save tax money by producing a picture cooperatively, as reported by Hedda Hopper in her gossip column?

Could that be a so-called "emergency purchase," of the kind that permits co-op grocery stores to sell tax-free not only farmer-grown butter and eggs, fruits and vegetables, but also salt and pepper, spices, clothespins, tabasco sauce and the thousands of other items on which a competing grocer is expected to pay tax?

And who, may I ask will pay the astronomical bills of Government in the day when cooperation reaches the millenium it is obviously planning?

Make no mistake about it. Cooperation has plans that will take you over if it gets away with making the new rules of business. By law, it is taught in the schools of Wisconsin, and its tentacles are reaching out to other states as well. It denies that it is socialistic, but the Socialists embrace it as their own and taunt the co-ops for their squeamishness in not admitting how far to the left they really are.

The greed of the co-ops can be measured only by the multiplication table. Aims for the future are boldly stated as three times, four times, five times present size—and in their calculations there is only one small *if*.

"If we can lick National Tax Equality Association in Congress," they say, then we can grow without let or hindrance. "If we can lick National Tax Equality Association," then we can continue to add our tax liability to capital and grow with such speed that we shall control the world.

Of course, if NTEA does win—and we expect to win—then the co-op story will be different. And so, in quick order thereafter, will be the story of the presently tax-free electric projects, whether owned by cities, counties, states, or by the Nation itself.

Do not think, however, that the disease will cure itself without our doctoring. Cooperatives used to say that they wanted only a little share of the national business—not more than a modest 15 per cent at the outside. But they are already marketing more than 20 per cent of all commodities produced on farms. Today, they market more than 75 per cent of all fluid milk produced in the United States; 50 per cent of butter; 55 per cent of the citrus crop; 95 per cent of lemons; 50 per cent of grain sold locally; 20 per cent of livestock; 30 per cent of rice.

They are planning, it is said, ten thousand stores to sell automotive supplies. They expect, they say, to put a co-op tractor on every farm in the United States. They are setting up food stores—some farmer-owned and some city-owned. They are drilling oil wells and planning more production of gasoline.

With the propaganda help of Uncle Sam—paid for by your taxes and mine—they are spreading their net wider and wider. Subtly, they sell their system as the "good" way of doing business, with rather more than a mere suggestion that taxpaying private enterprise is largely made up of evil-intentioned pirates, highbinders and cattle thieves.

Their defense of income tax exemption is based partly on this so-called goodness, partly on denial that they made a profit in their operations.

The goodness we can cast aside as totally irrelevant. There is no provision in the law that sets up "goodness" as a reason for not paying taxes. A Sunday School superintendent is quite as liable for tax on his income as a black-market racketeer.

As for their profits, let me quote to you a recently published statement by the auditor of the Farmers Union in which he let the cat all the way out of the bag. He said: "We have sales, less the costs of goods sold, leaving gross income or gross profit. These are accurate business terms, applying to cooperatives of the buy-and-sell type just as much as to other business. From gross income or gross profit, co-ops deduct their operating expenses, and also reserves necessary for the maintenance of facilities or for other purposes. These are exactly the same deductions made in old-line businesses and there is no need for any different terminology. . . . The remainder is net income or net profit. In economics and accounting that is exactly what it is and there is no good reason for calling it anything else."

On that profit the Federal income tax should be paid and some day, beginning probably next year, it will be paid. They know that themselves. As the National Association of Cooperatives wailed in a January bulletin:

"This tax fight is going to be a fight to the finish. Whether it be now or at some later date is not so important; what really matters is that a day of reckoning lies ahead. Never again is it likely that co-ops will be permitted to go their own way, minding their own affairs with the rest of the business world oblivious to their existence. Cooperatives have arrived. They must accept the burdens and tribulations which inevitably attend success. . . . "

In meeting with you here today, I have dwelt at greater length upon the cooperative aspects of income tax exemption than upon the disadvantages that your own industry suffers in the field of taxation. I have done this deliberately, because I have wanted you to see the length and depth of the battlefront upon which we are engaged, and to comprehend the strength of the various armies that have come together under the banner of tax equality.

You are not unaware, I am sure, of the skirmishes that are constantly fought in your particular behalf—the unrelenting guerrilla warfare, I might call it, that goes on week after week in the effort to awake public consciousness to the encroachments of government ownership and the resulting increased taxes that each individual must pay.

All along the line we are faced with a knock-down, drag-out fight—which will help us win. Time will not cure the situation, for time is running out against us and not for us. Our opponents are tough and well organized. Their lobby has great power. They have a rough ally in labor—for labor, too, is eyeing cooperation as a way to put more money into its pockets. "Farmers make money on their co-op stores and factories," said a recent AF of L cartoon. "Why shouldn't labor have co-op stores and factories too?"

But we have right and justice on our side—and in the end, they will prevail. We have no doubt of that.

For your part, you have allies whom you hardly knew before—strong, fighting friends among the businessmen who are battling for their lives against the tax advantages of competitors.

We shall at least tell the Ways and Means Committee how much revenue might accrue to the Treasury if these state and city power enterprises were taxed. Sampling 505 separate establishments in 397 cities, we have found operating revenue of $665 million and operating expense of $364 million, leaving, roughly, a profit of $300 million subject to tax.

And although municipal account-keeping may be difficult to compare with the accounting practices of industry in general, the sums involved are so large that the Ways and Means Committee might well direct the Treasury to investigate the possibility of tapping this reservoir of income—income derived from commercial activities and in many cases in direct competition with taxpaying enterprises.

You must pay your share, said Justice Frankfurter. That is the nub of the whole matter. It applies to the cooperatives; it applies to the mutuals; it applies to the Government-owned electric projects, the REA's, the municipals and all the rest.

(*Continued on page* 248)

1. They put their heads together . . .

Committee of college professors representing the College of Agriculture of the University of Wisconsin in charge of the electric research farm experimental work and members of the Rural Electric Service Committee of the Wisconsin Utilities Association.

Bottom Row, left to right: Prof. E. E. Heizer, Chairman, Dairy Husbandry Dept., R. Bowen, Wisconsin Gas & Electric Co., Prof. W. W. Wilcox, Agricultural Economics Dept., Acting Dean W. E. Kivlin, College of Agriculture, A. B. Barfield, Wisconsin Electric Power Co., Prof. F. W. Duffee, Chairman, Agricultural Engineering Dept., Prof. B. A. Beach, Veterinary Science Dept.

Top Row, left to right: R. Piper, Wisconsin-Michigan Power Co., A. J. Von Burg, Wisconsin Power & Light Co., Prof. S. A. Witzel, Agricultural Engineering Dept., Prof. R. J. Muckenhirn, Soils Dept., A. F. Herwig, Wisconsin Utilities Association, L. C. Hoffman, Northern States Power Co., H. C. Canfield, Wisconsin Public Service Corp., A. A. Pfingsten, Wisconsin Public Service Corp.

The Wisconsin Research Farm

AN electric research farm project has been begun by the College of Agriculture of the University of Wisconsin, in cooperation with the Wisconsin Utilities Association, according to A. F. Herwig, Association Secretary.

The farm, which was purchased by the Association and turned over to the school, will be used to conduct experiments in electrical mechanization of dairy farmsteads, to reduce time now required for chores that absorb much of the day.

Russell H. Reed, agricultural engineer, has been appointed project director, and a farm manager and assistant also employed.

Actual work has been started to prepare the farm for the experiments. Crops are now growing to feed the livestock, following adoption of a five year crop program. Pasture renovation has been continued at 7 day intervals, and oat land has been plowed for the experiment.

The farm home, shown below, has been remodeled for the project. The farm itself consists of 144 acres, and 47 additional acres have been leased to raise more corn, grain and hay.

Mr. Reed, whose photo appears below, is a University of Wisconsin graduate, with several years experience in agricultural engineering work with colleges and farm implement companies.

2. and put him to work . . .

Russell H. Reed, Project Director

3. here.

The farm home, shown in process of remodeling for the experiments.

What Bituminous Coal Research, Inc., Is Doing for the Coal Industry

By J. E. Tobey

Chairman, Technical Advisory Board, Bituminous Coal Research, Inc., and Director, Fairmont Coal Bureau

Address before the Annual Meeting of the Electric Institute, New York, N. Y., June 4, 1946

THE Coal Industry pays high tribute to the Electric Utility Industry and its allies for their outstanding contributions through research and development. These contributions have reduced the coal rate per kilowatthour from 8 lbs to 1.30 lbs in the past 50 years, with the most modern plants as low as ¾ lb per kwhr, and the cost of electricity to domestic consumers from 25 to 3.3 cents per kwhr. The development of high pressure, high temperature steam by the utilities made possible the outstanding performance of our naval fleets in World War II. This feature alone gave our Navy advantages in speed, maneuverability and cruising range far exceeding all other navies of the world.

If this discussion were to cover the subject of research in its broad aspects, it would be presumptuous for the coal industry to attempt to give enlightenment to the electric utilities in the face of their outstanding accomplishments. However, this discussion has to do with industry or association research, often classified as "general interest" research, in which the coal industry is now engaged:

The research and development work affecting the electric utility industry has up to now been done mainly by individual utilities and electrical equipment manufacturers. It might be well to point out here that, according to the December, 1940, report on industrial research by the National Resources Planning Board for the year 1938, utilities—gas, light and power—spent .15 per cent of their gross revenue for research. The electrical machinery industry (including apparatus and supplies) spent .75 per cent of its gross revenue. These figures may be compared with the three industries which spent the highest percentages for research—Radio Apparatus and Photographs, 1.6 per cent of gross revenue; Electrical Communications, 1.4 per cent; and Chemicals, 1.3 per cent. The Edison Electric Institute advises that one member who led in research spent .6 per cent of gross income in 1936 for this purpose and that the average for all members was one-fourth that of the leader, amounting to .15 per cent of gross revenue.

Stating the case differently, the EEI member companies, with a gross revenue of $2,250,000,000 in 1945, must have spent $3,337,000 for research if the 1936 rate for such expenditures still held true. On the other hand, had all the members expended on research at the 1936 rate for the leading company, this amount would have been about $13,500,000.

Since receiving this assignment I have taken a quick look at your industry, and from a background of 12 years' experience in research for the Bituminous Coal Industry I take the liberty of making some observations which I hope will be helpful to your industry.

Why Industrial Research?

No industry is as vitally concerned in the use of a product as the industry which produces that product. It is not economically good business—in fact, it is hazardous—for an industry to depend solely on research done by associated industries or members of these industries. It is perfectly natural that the interests of associated industries do not entirely parallel the interests of a basic industry. Neither do the interests of individual members of a basic industry coincide in all respects to the needs of the whole industry.

In other words, there are two gaps in the research front which industry research can fill: (1) General interest research beyond the scope of associated industries and (2) General interest research beyond the scope of individual companies within a basic industry. Simple examples will serve to illustrate.

Low frequency (normal) induction heating is good business for utilities but has no particular attraction for electrical appliance manufacturers because it requires very little special equipment. Although both low and high frequency induction heating have their place in industrial processes, it is to be expected that the equipment manufacturer will spend money for the development of high frequency equipment. Here's an opportunity for industry research. Industry research by the utilities could give industrial customers engineering data on the application of low frequency current for induction heating and thereby increase the use of electricity. The coal industry, for instance, is naturally more specifically interested in the success of coal-burning appliances than is the appliance manufacturer, for its life depends to a great extent on these. The appliance manufacturer's interests may vary and, if profits are attractive, he may bring out complete lines of appliances for fuels competitive with coal. Also, coal-burning appliances may be good enough to produce a satisfactory profit for the manufacturer, but they may not be good enough for the coal industry to meet long range competition from other fuels.

In regard to the second gap, research done by individual members of an industry will be spotty and will not result in a well-balanced, long range program for the entire industry. Individual companies often select projects which fill their specific needs and avoid other projects which are of secondary interest to them or too expensive for one company to undertake—the latter often being of the "general interest" type which could best be done by the industry. House wiring, radiant and reverse cycle (refrigerator) heating might fall in this category.

In other words, the Electric Utility Industry, like the Coal Industry, needs research converging from three different directions — its associated industries (equipment manufacturers), its individual companies, and itself.

This triple approach provides for a complete and well balanced program

Industry research is the keystone to the whole program. It joins together and supports the other two sources. It provides a front and center for research, a clearing house for ideas and inventions, which otherwise might not receive attention. The industry research organization can "spark" or stimulate research in the other spheres. Its interests being very broad, it can work closer to the consumer and better interpret his overall needs.

Like the coal industry, the principal area of weakness in the Electric Utility Industry probably exists in the utilization of its product. The industrial prosperity of America depends solely on better serving the consumer. When an industry fails to adequately meet the consumer's requirements in improving his living standard, forces disruptive to that industry are set in motion.

How can an industry like the Electric Utilities, whose product is sold directly to the consumer, better keep pace with the latter's requirements than through a central research organization which can constantly investigate these requirements and set in motion the necessary machinery to provide for them?

Industry Research Must Pay Its Way

There is a surprise in store for those who think that this is necessarily a costly undertaking. Initially an industry engaging in research must learn to crawl before it can walk. First an administrative organization must be created with its technical and sales advisory bodies. The next logical step is to employ a Research Director. This is a critical step, for much of the success of any research program depends upon the capabilities of the directing head. This man should be selected for his energy, originality, technical ability, and last, but not least, his promotional ability to keep the members, their allies, and the public sold on the research program. He in turn should be allowed to select his headquarters staff.

Research workers, who are the producing units, must be carefully selected and trained, and relatively simple projects chosen at first—and these are naturally inexpensive. The number of research workers who can be absorbed in the early stages of a program is relatively small.

Because the new organization is working in relatively virgin territory, some of the initial projects, although simple in character, may pay handsome dividends. This will set the organization off to a good start, build confidence among contributing members, and give the whole effort a highly desirable psychological lift. After convincing the most skeptical members that a mild dose of research can strike "pay dirt," the stage is then set for a more comprehensive program and for higher stakes.

The Bituminous Coal Industry, sorely oppressed by the competition of newer fuels and frustrated by a great weakness in the utilization end of its business due to inadequate and obsolete equipment and a very rusty consciousness of consumers' requirements, organized Bituminous Coal Research, Inc., in 1934. Since that time it has passed through all the phases mentioned above and is well over its growing pains.

Believing that there are some common areas and a sympathetic interest between the Electric Utility and the Coal industries, there follows a brief description of the B. C. R. organization and some of its work.

Bituminous Coal Research, Inc.

Depression-born 12 years ago and poorly supported, it was nip and tuck during the first six years whether the infant, B. C. R., would survive. Little Liza on the ice had a less precarious time than did B. C. R. in its early stages. Only a pitiful few coal operators were definitely sold on research. Some of the operators said, "We don't want any part of it, for we would be digging our own graves," and, "see what the utilities and railroads have already done to us by improving the utilization of coal—they now use only half as much coal per kilowatthour and per gross ton mile as they once used." These men failed to recognize that this was the formula for life, not death, and that the day would soon come when the utilities and railroads would use more coal than ever because of increased business.

In 1941, as a result of more enlightenment, better financial condition of the industry and a bad scare from oil, natural gas and hydro power, the industry began to support B. C. R. in earnest. And in 1943, a two and one-half million dollar, five-year research program was underwritten. This was later augmented by another million dollars for locomotive development, subscribed by six railroads and three large coal companies.

Today B. C. R. is in good financial condition, new members are constantly joining the ranks in support of its program, and the bottleneck is now research workers rather than money. The contributors include 247 coal companies and associations (whose annual shipments exceed 221,000,000 tons), seven railroads, 19 equipment manufacturers, one electric utility (Alabama Power Company), and one casualty insurance company.

As to accomplishments, the situation is indeed outstanding. For an expenditure to date of less than a million and a half dollars, B. C. R. is far advanced in the development of revolutionary coal-burning equipment ranging from small stoves to gas turbine locomotives. This embraces stoves, ranges, water heaters, furnaces (domestic and industrial), stokers, pulverizers and locomotives. In addition to the development of these major units, work is going forward on more than 40 other projects, many of which are of definite interest to the electric utility industry. (See appendix.)

Rather than own its laboratories, B. C. R. has found it entirely satsfactory to contract with existing laboratories to do its work. At present the projects are divided among eight well-known laboratories and institutions.

Subscribers and other interested parties are kept informed of research progress by a well illustrated printed bulletin which is issued quarterly by B. C. R. In addition, an annual meeting is held at a laboratory in which the subscribers are given an opportunity to see first-hand some of the results of the research work and at the same time sessions are held in which the project engineers describe in detail the work which is being done.

Organization

A non-profit corporation under the laws of the State of Delaware, the organization of B. C. R. consists of the following: a President, three Vice-Presidents, Assistant to the President, Treasurer, Secretary, Assistant Secretary and Treasurer, a board of 15 directors who are presidents or vice-presidents of member companies, a Technical Advisory Board of 40 Fuel Engineers of member companies, and a Sales Advisory Committee composed of nine sales executives and advertising managers of member companies.

A paid headquarters staff supervises the actual functions and work of B. C. R. consisting of a Director (also Vice-President), an Assistant Director (also Assistant to the President), two technical assistants, a Promotion and

Publicity Representative, and necessary office help.

Conclusion

Perhaps the most remarkable results of research in the coal industry are found in the spiritual rather than the physical side. There being practically no controversial aspects to general research, it has actually unified the industry perhaps more than any other activity in which it has engaged. It has furnished a rallying point and a common ground on which to meet. The Industry is proud of its research organization and program, and its personnel feels that it is working for a progressive industry. Well over 100 fine technically trained men are now engaged on projects in the industry. This, of course, will have a profound effect on alert and capable young men of the type the industry needs to attract for its future well-being.

Success in this endeavor also unquestionably played an important part in causing the industry to launch later two other important organizations — Bituminous Coal Institute, which deals with publicity and public relations, and a new producer-dealer organization yet unnamed, to improve merchandising and service for domestic consumers.

The Coal Industry is filled with a new spirit of determination and has taken the offensive. It has a tough fight ahead, but research has given it a fighting heart.

APPENDIX

What is B. C. R.?

Bituminous Coal Research, Inc., is the National Research Agency of the Bituminous Coal Industry.

It is supported by 247 coal companies, whose annual shipments total 221,000,000 tons. Contributions from the industry are on a voluntary basis of one-fourth cent per ton of shipments.

In addition, seven railroads contribute one-sixth mill per dollar of gross traffic revenue from bituminous coal, to B. C. R.'s general research program. Six railroads, including three of the above, have provided over $800,000 for the B. C. R. Locomotive Development Committee project.

Participation is open to all who wish to invest in the research program.

B. C. R. Objectives to Apply Science and Technology To:

1. Increase satisfaction and public acceptance of coal through new and improved equipment.
2. Help maintain a high level of coal consumption.
3. Develop new markets for coal.
4. Increase and disseminate knowledge of coal.
5. Stimulate and coordinate coal research by others.

B. C. R. Functions

1. Organizing Research Programs.
2. Financing Programs.
3. Contracting with Laboratories.
4. Administering Programs.
5. Appraising Results for Patent Possibilities.
6. Distributing Reports of Research.
7. Stimulating Practical Use of Results.
8. Advising Others Who are Developing Coal Equipment.
9. Cooperating with Other Agencies of the Industry.
10. Technical Information Service on Coal.
11. Assistant Technical Committees Working on Industry Problems.
12. Stimulating Coal Research by Others.
13. Promoting Education and Training of Technical Men for the Industry.
14. Summarizing Results of Research Program for Sponsors.

B. C. R. Projects

I. RESIDENTIAL AND SMALL COMMERCIAL

- GENERAL
  - Residential Group Heating
  - Improved Designs for Coal-Heated Homes
  - Better Chimneys
- AUTOMATIC EQUIPMENT
  - Ash-Removal-Stoker Development
  - Determining the Performance and Rating of Ash-Removal Stokers, Using Various Coals
  - Adapting Clinkering Stokers to Wider Range of Coals
  - Improving Automatic-Coal-Feeding Methods
  - Compact Stoker-Boiler Units for Commercial and Small Industrial Uses
  - Use of Stokers for Curing Tobacco
- HAND-FIRED EQUIPMENT
- DEVELOPMENT OF SMOKELESS HEATING EQUIPMENT:
  - Stoves and Circulating Heaters
  - Warm-Air FURNACES
  - Kitchen Ranges
  - Water Heaters
- DETERMINING THE PERFORMANCE AND RATING OF SMOKELESS EQUIPMENT AS IT BECOMES AVAILABLE, USING VARIOUS COALS
- CONVERSION DEVICES TO PERMIT SMOKELESS OPERATION OF PRESENT HEATING EQUIPMENT
- IMPROVED ASH-HANDLING METHODS

II. LOCOMOTIVE, INDUSTRIAL, CHEMICAL AND MINING

- RAILROAD LOCOMOTIVES
  - Coal-Fired Gas-Turbine Locomotive*
  - Overfire Air Jets to Control Smoke
  - Improving Performance Through Better "Drafting"
  - Undergrate Air Distribution
  - Effect of Fuel on Locomotive Performance
  - Handling Coal to Minimize Breakage and Segregation
- INDUSTRIAL POWER AND HEATING
  - Smoke Prevention by Overfire Air Jets
  - Pulverized Coal Firing of Forge Furnaces
  - Pulverized Coal Firing of Radiant Tube Furnaces
  - Flow of Pulverized Coal and Air Mixtures
  - Meter for Coal-Air Mixtures
  - Higher Rates of Heat Release and Transfer
  - Compact Stoker-Boiler Units in Lower Size Range
  - Coal-Fired Gas Turbines*
  - Flash Pulverization*
  - Combustion of Pulverized Coal under Pressure*
  - Fly-Ash Separation from Hot Gases*
  - Coal Feeding under Pressure*
- CARBONIZATION, GASIFICATION AND CHEMICAL USES
  - Complete Gasification of Pulverized Coal
  - Basic Study of Gasification Reactions
  - Heat Transfer into Coal
  - Developing Tests for Physical Constants of Coke
  - Evaluating Coke Quality from Tests

*B.C.R. Locomotive Development Committee Project.

Production of Chemicals by Hydrogenating Coal
Coal for Soil Treatment

COAL MINING AND PREPARATION
Control of Acid Mine Drainage
Lighting of Picking Tables
Drying Coal Fines
Dustproofing
Freezeproofing
Corrosion of Stoker Screws

CHEMICAL AND PHYSICAL PROPERTIES OF COAL
Reactivity of Solid Fuels with Air and Oxygen
Ignition Temperature Test Method
Combustion Behavior of Individual Coal Particles
Behavior of Ash Particles during Combustion
Properties of Micron-Size Coal

Research Laboratories

Summary of B. C. R.—Sponsored Projects

BATTELLE MEMORIAL INSTITUTE
Residential Group Heating
Stoker Development Work
Developing Smokeless Hand-Fired Stoves, Furnaces, Ranges, and Water Heaters
Performance, Coal Adaptability and Rating of Coal-Fired Heating Equipment
Improved Ash-Handling Methods
Better Chimneys
Improved Steam-Locomotive Performance
Smoke Prevention by Overfire Air Jets
Industrial Heating with Pulverized Coal
Compact Stoker-Boiler Units
Pressurized Combustion of Pulverized Coal*
Drying Coal Fines
Dustproofing and Freezer-proofing Coal

CARNEGIE INSTITUTE OF TECHNOLOGY
Basic Study of Combustion and Gasification Reactions
Heat Transfer into Coal
Evaluating Coke Quality
Production of Chemicals by Hydrogenating Coal

INSTITUTE OF GAS TECHNOLOGY
Flash Pulverization of Coal with Steam*
Fly-Ash Removal from Hot Gases*
Feeding Coal against Pressure*

*B.C.R. Locomotive Development Committee Project.

JOHNS HOPKINS UNIVERSITY
Coal Handling and Pulverizing under Pressure*
Flash Pulverization of Coal with Air*
Demonstration-Scale Coal-Fired Gas Turbine*

PURDUE UNIVERSITY
Effect of Sulphur on Hot Metals*
Testing Fly-Ash for Rail Sanding*

SOUTHERN RESEARCH INSTITUTE
Instrumentation for Pressurized Coal Feeding*

WEST VIRGINIA UNIVERSITY
Control of Acid Mine Drainage

ALCO PRODUCTS DIVISION OF AMERICAN LOCOMOTIVE CO.
Tests of Full-Scale Coal-Fired Gas-Turbine Assembly*

ASSIGNMENTS NOT YET ANNOUNCED
Improved Designs for Coal-Heated Homes

Aims and Purposes of NAEC

(*Continued from page* 231)

National Committee for Electric Service to Farmers, to be broadened by invitation to REA and other bodies; for a general program of stimulation of extension of service to more farmers, research looking to improvement of electrical equipment for farm use, and the most efficient and economical methods of application of electricity on the farm, etc.

7. Participation in the comprehensive income tax study being made under the supervision of Professors Dorau and Foster.

In each of these activities beginnings have just been made and accumulated experience and benefits are some of the stepping stones for larger and more effective accomplishments in the future. I will not take the time to go into detail with respect to the separate items of work, but I earnestly urge each one of you to assist in this activity in order to add to its effectiveness. Quite a few of the members of the Institute have not yet joined the new Association and we sincerely invite all of them to become members. The cost is moderate and we believe that the expenditure is exceedingly worthwhile. We hope that many companies will see fit to join this mutual effort in the near future and we welcome them.

Much has been said and written in various places concerning the policy of the members of the Association on river development, water control, and related matters. The foundation of this policy is the river development announcement by the 167 electrical companies in the advertising program last August. That is basic and the Association members are earnestly in favor of effective flood control, good improvement of rivers and harbors, economical navigation projects, worthwhile reclamation and irrigation projects, all if soundly planned on the basis of reasonable economics and efficiency.

In conclusion, we ask all of you to give us the benefit of your suggestions and useful data you have assembled and we wish that you would direct any inquiries to us concerning any matter that would be beneficial to the attainment of good accomplishment by the electric light and power industry for its customers, employees, and the national economy.

Progress Towards Income Tax Equality

(*Continued from page* 243)

Two years ago, the Ways and Means Committee of Congress started an investigation of the tax-exempts. It called for financial statements and stated, with great positiveness: "It is the intent of your committee to make a thorough study of the information contained in such returns with the view to closing this existing loophole and requiring the payment of tax, and the protection of legitimate companies against this unfair competitive situation."

The returns have been filed by many tax-exempt organizations and corporations. They have been examined carefully. They disclose a definite tax liability. It is now up to Congress to complete the job it has begun and to establish tax quality as a national policy. We invite you to go to Washington with us —maybe later this month; maybe immediately after the election—to join with the army of businessmen who are determined to win the battle for tax equality.

A price list of
EEI PUBLICATIONS
will be supplied upon request to
EDISON ELECTRIC INSTITUTE
420 Lexington Ave., New York 17, N. Y.

Resumé of

Productive Power—A Method of Selling New Uses for Electric Power to American Industry

By J. M. McKibbin, Jr., and C. B. Stainback

Assistant to Vice-President and Manager of Industrial Department, Westinghouse Electric Corp., Respectively

Resumé of a Presentation before the Annual Meeting of the Edison Electric Institute, New York, N. Y., June 4, 1946

HOW American industry can overcome rising costs in materials and labor by better, faster and more economical production, through the investment of $239,000,000 in the application of seven modern electrical techniques to manufacturing, was described to the Edison Electric Institute's annual meeting June 4 by C. B. Stainback, manager of the Westinghouse Electric Corporation's Industrial Department.

Mr. Stainback listed these seven techniques in introducing a "Productive Power" exhibit, which is soon to tour the nation to help industry solve many of its production problems.

Most pressing of all needs is adequate wiring, according to Mr. Stainback. Approximately $90,000,000 worth of wiring facilities should be installed in American factories to modernize existing facilities for most efficient production. Lighting fixtures and lamps will add another $65,000,000; air cleaning with the Precipitron and air conditioning, $25,000,000; radio frequency heating, $20,000,000; and resistance welding equipment, furnace brazing equipment and infrared heating, $39,000,000 more.

Living Standard Dependent on Electric Power Usage

The electrical industry is satisfied, Mr. Stainback pointed out, that sustaining and improving our standard of living is dependent on continued increase in the utilization of electric power in industry. Productive power is a contribution to this nationwide effort to promote the further electrification of American industry.

It is a traveling forum that will bring to countless American people for the first time a cross-section of a modern industrial plant demonstrating the actual operation of highly-developed electrical processes largely responsible for the high standard of living they enjoy.

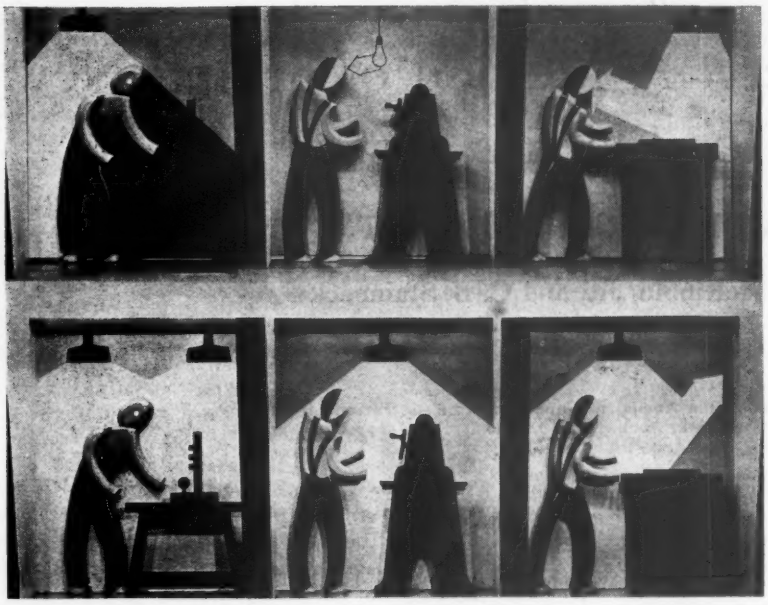
Demonstrating the operational simplicity of electrical equipment, the Productive Power exhibit contains a modern electronic resistance welding machine Those in the audience, inexperienced in factory operation, were called upon to operate the welder and join steel sheeting more neatly and securely than an experienced workman could do with the riveting method.

Tomlinson Fort, manager of Westinghouse's central station sales, declared that installation of these seven electrical processes, along with lesser war-born developments, would increase by 27 per cent the amount of horsepower at the command of each worker over the amount at his disposal during the height of the war production.

Seven Manufacturing Methods Demonstrated

J. M. McKibben, Westinghouse assistant to vice-president, who directed the Productive Power show, declared that manufacturers will be extremely dependent in the future upon all types of electrical devices in order to meet successfully the challenge of survival and growth. This program has been prepared to help manufacturers thoroughly

Westinghouse engineers' conception of a modern industrial plant is shown here in this three-dimensional scale planning of modern model factory exhibited before the Annual Meeting of the Edison Electric Institute. A view of miniature layout, complete with latest electrical equipment designed to produce goods faster, better and at less cost.



How to overcome defects in modern factories is shown in this Westinghouse Electric Corporation exhibit shown before the Annual Meeting of the Edison Electric Institute. The upper row of models shows improper lighting resulting in shadow, blinding and glare. In the lower row of models, lights have been corrected to give proper lighting.

analyze their problems and adopt most efficient methods to meet their specific needs. Productive Power covers seven applications for electric power in industry.

The first deals with adequate wiring. A scale model factory layout is used to demonstrate the advantages of better wiring, power-factor correction and the application of circuit breakers.

Section two deals with resistance welding. Here the advantages of resistance welders equipped with electronic controls is demonstrated by testing actual welds in a tensile tester.

Third, lighting. The problems of shadow, direct glare and reflected glare are illustrated with the proper steps for correction. Other demonstrations show the importance of adequate quantity, proper distribution and good maintenance.

Fourth, electric furnace brazing. Here, an animated sound slide film demonstrates how simple capillary action had made mass production brazing possible. Then with actual samples, the results of electric furnace brazing in industry are reported.

Fifth, infrared drying. The mysteries of infrared are dispelled by this demonstration by running and comparing the drying time and efficiency of forced air, heated air and infrared.

Sixth, radiofrequency heating. The speed and selectivity of induction heating is shown by use of an induction generator. This section of the program will be primarily a laboratory session on industrial heating problems.

Seven, air handling and conditioning. Case histories are used to prove how air can be put to work in industry. Then with actual equipment, the air cleaning efficiencies are compared with mechanical and electrical air cleaners.

The Productive Power show shortly will go on a nationwide tour lasting approximately a year. It will be exhibited in most cities in the United States having a concentration of industrial activity. The elaborate properties used in depicting the new benefits of electric power will be set up in the largest auditorium available in selected cities. Representatives of all industries will be invited for a full day presentation of new modern electric methods in industry. Industrial engineers and executives will be shown how new electronic equipment is being used in our most modern plants.

Plant Survey to Provide Case Examples

As most of the engineers and operators of the hundreds of thousands of small factories all over America cannot visit installations of new and revolutionary electrical equipment, Productive Power will take replicas of installations into the home towns of such industries for them to see personally. Actual machinery, such as high speed electronic welding apparatus and high frequency oscillators, are set up on the stage.

Preceding a field showing in any section of the country, Westinghouse Manufacturing Engineers will have surveyed representative plants in the territory. Such surveys will permit program slanting and special emphasis of individual elements so as to adopt it properly for specialized industrial groups.

Later this year there will be regular issues of Productive Power Bulletins. These publications, available for customer mailings, will be based entirely on case histories that illustrate how electricity can profitably be put to work.

Scheduling of presentations of Productive Power will be made through the local electric utilities serving the area where the showing will be held.

CL&P Co. Establishes Scholarships in Agriculture

TWO permanent scholarships of $300 a year, each for a four-year course in the College of Agriculture of the University of Connecticut, have been established by The Connecticut Light and Power Company, it has been announced by Dr. Albert Jorgensen, president of the university. Two scholarships will be awarded the first year and two more in each succeeding year. In the fourth year and thereafter eight scholarship students will be enrolled at the university each year and the power company's annual contribution will be $2,400.

The scholarships will be known as The Connecticut Light and Power Company Scholarships. They will be awarded by the Scholarship Committee of the University, on the basis of Americanism, character, cooperativeness, likeliness to succeed, scholarship, and financial need of applicants.

The scholarships are open to sons and daughters of Connecticut families actively engaged in farming, with preference to applicants who have demonstrated initiative and ability in 4-H Club work and who reside in The Connecticut Light and Power Company's rural territory.

C. L. Campbell, President of The Connecticut Light and Power Company, expressed his pleasure in presenting the scholarships and pointed out that the development of rural Connecticut will eventually be reflected in a better way of life for all Connecticut citizens, since the growth of agriculture, America's greatest industry, is necessary to promote a high economic standard for all.

More Power to America

A Critical Appraisal of a New Industrial Load-Building Technique After a Year of Testing in the Field

By W. V. Merrihue

Manager, Apparatus Advertising and Sales Promotion Divisions, General Electric Company, Schenectady, N. Y.

Address before the Annual Meeting of the Edison Electric Institute, New York, June 5, 1946

THE time has come, the walrus said, to speak of many things. He's wrong—if he's addressing us today!

The time has come to speak of *one thing*—and then to leap into action to do that one thing which is *selling*.

"Not today!", I hear voices rising in protest, "we've got nothing to sell; we've issued orders not to take on another piece of load. No thank you! We're not going to poke sticks at the animals."

But I'll hold my ground because I'm not speaking of order-taking. I'm speaking of long-range, low-cost mass selling in the Industrial Market. I want to see us organize to sell to industry the way you've sold to the domestic and commercial markets.

I'm recommending that we take out a sales annuity policy today—we may be a year late already—so that it will begin paying off as early as 1948; and every year thereafter.

The policy we're suggesting is an industry-wide creative-selling program called the "MORE POWER TO AMERICA" plan. We underwrite the initial cost of the plan and pay a continuing amount into it each year, but in order to enjoy its benefit you, and other members of the industry, are asked to pay in annual premiums in the form of creative sales effort.

Unlike many sales plans brought to your attention by manufacturers, we are not asking the industry to push our goods. We have a broader vision than that. I can best illustrate it with this cherry pie. Let us imagine that this pie represents the "total-available business" in equipment sales in the laundry industry, or the sewage-disposal, or the foundry industry. Now by high pressure competitive selling we might cut ourselves a slightly larger piece of this pie—but somebody else is going to get a smaller piece and maybe some little fellow will get none. The obligation of leadership, as we see it, is not to get a bigger piece of the present pie but to increase the size of the pie so that everybody may get a bigger portion.

That's creative selling as contrasted with competitive selling. That's an obligatory business philosophy for American industrial leaders.

In this light, let us re-examine quickly the features of this far-reaching creative-selling program we have offered to the electrical industry.

The "MORE POWER TO AMERICA" program has been built upon a careful analysis and thorough study of the amount of machinery and electric power at the command of workers in various industries. We found that American Industry as a whole is using only five kilowatt hours per manhour employed.

Some industries are using as little as one-quarter of a kilowatt hour per manhour while others are profitably employing nearly 100 times as much. Our studies revealed that while industry is pretty thoroughly motorized it cannot be called thoroughly electrified, for although electric motors furnish 86 per cent of the horsepower used in manufacturing, American industry is still less than 50 per cent electrified. There is a tremendous creative-selling job to be done to get industry to take full advantage of *proved* applications of electric power, let alone those which are constantly resulting from new developments.

As our common goal for this program we propose increasing the industry-wide use of electricity by one more kilowatt hour per manhour by 1950.

To get enough manpower to do this job, we must work together to form a creative-selling alliance of electric utilities, machinery manufacturers, electrical manufacturers, consulting engineers, and electrical contractors. We must coordinate to serve our common industrial customers most effectively, and promote fuller electrification.

As an electrical manufacturing member of this alliance, our company is taking six steps as its part of the program: Step one—More help from G-E sales engineers—We are adding trained men to our field sales organization as rapidly as manpower conditions allow. But here's something to remember. A certain number of these men are being earmarked to do nothing but creative selling, as called for by this program. The remainder of the force is being steadily educated to devote a portion of their time to creative selling. We hope that most machinery manufacturers and utility power sales departments will do likewise. Step two—Regional sales conferences—We expect to review detailed plans for these with you just as soon as manpower conditions of all members of the alliance warrant. Step three—The magazine *Load*, prepared especially for your power sales engineers. We are delighted with the grand reception which this helpful service is receiving. Step four—Cooperative area promotional program—where requested by the alliance. Step five—Operating products exhibits and models. Westinghouse has made a very substantial contribution in this field of activity by making available the marvelous operating exhibits unveiled yesterday and we will be supplementing these with many of our own. Step six—A continuing series of sales and training program kits featuring sound films.

These films, which are the cornerstone of our program, can be used to train the sales organizations of all members of the MORE POWER TO AMERICA alliance and may then be used to sell power users on the advantages of modern electrical products and processes.

Last year three such programs were made available for your use. The one

on laundry contains a sound-slide film for showing laundry owners the many places they can profitably use electricity. It also includes a handout booklet to be given laundry owners, and a 72-page manual for power sales engineers. Electronic Induction Heating was our second offering to capitalize on the current interest in the high-frequency heating of metals.

The third offering was this 12-lesson course in Industrial Electronics which many utilities are using so effectively with their own personnel and with all types of industrial power users.

When we originally presented the basic idea of "MORE POWER TO AMERICA" endorsement by forward-looking utility executives was universal. One utility President put it this way: the "MORE POWER TO AMERICA" program is the most powerful plan that has ever been developed by the industry for industrial load-building purposes. It is the first time we have had such tools to use for industrial power sales. With them we can build our industrial load universally on a solid foundation; but even more important, we will improve our customer and public relations.

Yet in spite of such enthusiasm, an aggressive participation in the program has not been easy to get started. Cheers of approval here in the Waldorf ballroom are not always translated into vigorous action on your properties. In justice to all, however, the times have been most unusual. All partners of the alliance have been handicapped by lack of manpower. And no salesman is eager to take on a creative selling job when his desk is already buried under an avalanche of orders, requests for service, or complaints about slow shipments.

Also despite unparalleled foresight, many utilities have found themselves with just enough generation capacity to get by under existing load demands. Or if they have enough generating facilities, they are waiting shipment on distribution equipment.

We have all felt the wave of postwar strikes—with their resulting material shortages. No sooner is one shortage alleviated than two more hit us. The two essential materials of the electrical industry—coal and copper—have been as scarce as uranium.

Under such conditions, it would not be surprising if little progress had been made in putting the "MORE POWER TO AMERICA" program into operation. Some people have wondered if we did not release it at least a year too soon. To this I reply, "We're late!" Creative selling is an art that must be learned by thousands of new green salesmen—yes, by most of the old-timers. Working cooperatively in alliances uncovers many loose gears that must be made to mesh, viz, the United Nations. No, we have not a minute to lose. Our great production machine which astonished the world will soon be eating up customer backlogs faster than we dream. It's later than we realize! It is tribute, therefore, to the foresight of American utility executives to be able to report that, in spite of all obstacles, more than 100 utilities are putting the program to work in their communities.

Wherever one of the programs has been put on in the manner intended, and especially where the utility has contributed real imagination in its planning, results have exceeded everyone's expectations.

(At this point Mr. Merrihue asked Mr. John O. Roser, Director of field activities in the MORE POWER TO AMERICA program, to report on a few of the results which have already been obtained. Mr. Roser's comments appear at the end of this address.)

Encouraged and pleased by the reception of the laundry, induction heating, and industrial electronics programs released last year, we have gone ahead with intensive work on future programs. Two more are now available for your use—one on modern sewage treatment and the other on resistance welding. Both of these programs far exceed our original offerings. Keystone of each is a full-color sound motion picture. Supplementing these talking motion pictures is a sales and application manual prepared expressly for you and the other members of the alliance. We try to make these manuals the most authoritative guides to selling in existence. We usually retain an outstanding consultant and then work with utilities, machinery manufacturers, the government, trade associations, etc.

The assembled data is then organized and simplified and added to by our own application engineers.

A single manual may require six months or more to prepare and at a cost ranging from $15,000 up.

Finally, in each program, we make available a hard-working handout bulletin for your power users.

The movie on sewage treatment is entitled "Clean Waters." This picture is of interest to every Civic Group in the communities you serve—every city government, every Chamber of Commerce, every Izaak Walton League, every luncheon club, every sportsmen's group. The facts in it have been authenticated by the United States Public Health Service whose seal appears on the picture. They cooperated with us because it sells no one company's products.

After viewing this film, the Governor of Vermont stood up before a big audience gathered to prevent pollution from robbing Vermont of its huge vacation business, and said: "Gentlemen, there is only one thing wrong with your picture; it ought to have a smell track." At another meeting a nationally known consulting engineer arose. "That picture," he said, "is worth 10 million words. And I should know for I've said at least 10 million in the past quarter century on the dangers of sewage pollution, and never stirred my audiences quite as much."

Now let's take a quick look at the other new program—resistance welding. This new offering drives home the fundamentals which are the basis of our whole More Power to America program—how electric power can cut costs, save material, turn out better products, step up efficiency, and increase employment.

This program was developed with the cooperation of the Resistance Welder Manufacturers Association. One of the cardinal results of your sponsorship of this program can be the opportunity it gives your engineers for working closely with these welder manufacturers on power-supply considerations for new welder installations.

The active use of these "More Power to America" programs can bring electric utilities immediate rewards in terms of customer and community goodwill.

The resistance welding program was developed as a result of a meeting with the EEI Industrial Power and Heating Committee at which resistance welding and other subjects were discussed. One of the members told us that all of his load—industrial, domestic, and commercial—depended basically upon the prosperity of *industry* in his area. Therefore, he wanted a program to promote resistance welding as it offered such important advantages to his industrial customers. That kind of interest in customer needs is certain to pay dividends by retaining in your territory the industries which are the backbone of your whole economy.

The program on sewage treatment is exceptionally timely as 13,000 commu-

nities throughout the nation need to install sewage treatment facilities. These 13,000 communities provide unsurpassable opportunities for utilities to enhance their prestige by demonstrating their civic leadership through sponsoring "Clean Waters."

Certain utilities have pondered the wisdom of active sponsorship of this direly needed solution of a great national problem because their own customers were dumping waste into streams.

But they are our customers too and we have been delighted with their attitude. They see it coming and the more progressive ones believe they can install waste recovery equipment and market valuable by-products.

There is a still more important reason for urging action now. The electrical industry has an obligation to help build a peacetime America that will afford our people the best in life. The American people, whose standard of living is already the highest in the world, are determined that it shall mount even higher.

This cannot be achieved by laws, or government regulations, or wage increases that necessitate higher prices. A higher living standard can be achieved only through increased productive efficiency. The *real* income of the American worker can be increased only as his productivity is increased through greater and more efficient use of electricity.

The key to better living lies in our ability to produce, sell, and distribute more goods for more people at less cost.

If you doubt it, look at this. In 1920 a 60-watt lamp bulb cost 45 cents. In 1940 this same 60-watt bulb cost 10 cents and gave twice as much light. More machinery and higher electrical horsepower per worker gave us the mass production, and vigorous cooperative creative selling (Better Light-Better Sight) sold that production.

Or take another example from your own industry. Through increased productive efficiency and vigorous creative selling, especially in the domestic and commercial markets, the cost of electricity has been reduced 11 per cent in the past five years alone when most other prices were rising.

And if anyone thinks these lower costs came out of the hide of the worker let him contemplate this phenomenon wherein average hourly earnings for workers in all industry have gone up 40 per cent.

This is an old, old, incentive to you—producing and selling this nation of ours to an ever-higher standard of living—but we now have a new, and much graver incentive. We all passionately desire peace—we lift up our eyes bravely to the U.N.O.—but they waver apprehensively as each fearsome headline comes into view.

If we're stark realists we'll keep this great truth always in mind. The key to our national security has been and will remain the margin of our superiority in productive efficiency. Our population is becoming static and older. But we can give this population the strength of Samson and multiply its effectiveness.

To produce enough materiel to defeat the Axis required 32 billion man-hours working at the peak of World War II efficiency—and we had to scrape the very bottom of the manpower barrel to do it.

If we had been working at World War I efficiency, when each worker used only 1.2 kwhr per man-hour instead of 5, we would have required 78 billion man-hours—an utterly impossible task as we never could have found the *20 million additional workers* needed to do the job.

That's what American industry has been doing for this country—in a somewhat haphazard, non-coordinated manner—by selling, selling, selling the benefits of increased productive efficiency.

In conclusion, the two big jobs—Production and Selling—are recognized. Both of these jobs need adequate tools. We have proved that we have the ability and the tools to make things for war in unprecedented quantities, but in peace the full output of full employment has to be *sold*, and this is going to require some new approaches and some real, creative selling. It is for this reason that the MPA programs have been developed—five are already available and others are well along, including Oil Field Electrification, Materials Handling, Infra-Red Heating, plus a complete program for the farm which will be presented this fall.

But preparation of the programs is not enough. They must be put to work in the field, with the strength of all members of the alliance fully behind every presentation. We are telling our machinery manufacturer friends and other members of the alliance that they can expect the utility power salesmen to spearhead activities in each local area.

Take your pick—tackle the laundries; or stream pollution (a new sewage treatment plant in one of your communities is a new *industry*); or go after metal-working manufacturers with resistance welding or induction heating. You'll be delighted with results and your power-sales department will be conditioning itself for the extensive use of this mass-selling technique in the stern years ahead.

If the opportunity for bold imaginative action is to continue to be ours under the free enterprise system which has made America great, then we must continue to exercise our opportunity, recognizing it as a duty as well as a privilege.

Our efforts will be too little and too late if we wait until the last turbine now on order has been installed or until everyone has plenty of distribution facilities. Now is the time to train power salesmen, form alliances with manufacturers, consultants, and contractors, and to get some experience in using More Power to America's mass sales and educational tools. *This* is a long-range program. But the longest journey begins, says the proverb, with but a single step.

APPENDIX

Some Results of the More Power to America Program

By John O. Roser

WHEN we first took MORE POWER TO AMERICA to American utilities a year ago we told you that we had selected the Laundry Industry because it was a difficult one; and one which, although universal, had relatively little recognition as an aggressive Industry.

I'm going to report briefly on some of the beneficial results that this program alone has brought sponsoring utilities in different parts of the country. Here is a brief report from Carolina Power and Light:

"Through five major meetings we presented the laundry program to 88 laundries and 242 people. Our audiences received an excellent impression from the co-operative action of the utility and representative of other members of the MORE POWER TO AMERICA alliance.

"We got many requests for modernization surveys and the machinery manufacturers got firm orders for a large amount of new equipment. But even more important, our customer relations with laundries have been materially strengthened. At least three competitive situations which have been brewing for years seem to have been eliminated entirely and two steam-engine mechanical drives are being converted to purchased

power as a direct result of these meetings." And the total cost to us was *less than $500.00*.

Here's the report from Philadelphia Electric:

"Through a meeting of the Laundry Board of Trade we reached 75 to 80 per cent of the laundry volume in Philadelphia. The laundry operators were highly pleased to find our company so sympathetically and understandingly aware of their problems. Several commented that we seemed to recognize better than they the many opportunities for improving laundry operations.

"Our Company gained an even better understanding of the existing potential market in the laundry industry for additional power sales, which we expect to realize through educating, guiding, and assisting the laundries in the process of modernization."

Listen to Cincinnati Gas and Electric:

"Since the meeting with local laundry operators we have received numerous requests for information and help which we are going to be able to turn into load on our lines. We are convinced that the laundry program can produce very worthwhile results when it is carried out in accordance with the pattern provided by the "MORE POWER TO AMERICA" manual.

And now, for a result of the laundry program that is certain to be felt by every electric utility: The American Institute of Laundering is an association of the nation's 4500 leading laundries. It provides consulting services for its members.

For more than a decade their Special Engineering Report No. 35 has opened with these words: "Any laundryowner who at the present time is purchasing power should analyze his power costs in order to determine whether or not it is possible to generate power cheaper than purchasing it. In the great majority of cases, it is cheaper to manufacture power than to purchase it."

After several experiences putting the program to work in the field, based on close cooperation by Utilities, Manufacturers and Institute Representatives, the latter became anxious to bring their recommendations up to date and in line with new facts and changed conditions. Several conferences were held resulting in their latest recommendations which read as follows:

"In many localities public utility rates to laundries have been dropping while

(*Continued on page 264*)

Reading Meters in Multiples of 10 Kwhr

By L. M. La Porte

Controller, Wisconsin Electric Power Company

A SAVING OF more than 3,000 employe-hours a year in meter reading and billing operations is being made by Wisconsin Electric Power Company through a newly developed practice of reading electric service meters in multiples of ten kilowatt-hours, instead of in multiples of two kilowatt-hours, as was the previous practice.

This is the latest of a series of changes in meter reading and billing practices which the company has undertaken in the interest of simplification and economy. The company serves 271,000 customers in southeastern Wisconsin, most of them situated in the Milwaukee metropolitan area. Relatively few customer inquiries or complaints resulted from the changes, and no serious or permanent adverse reaction.

During the 1920's, in accordance with practices generally followed by public utilities in reading meters, Wisconsin Electric Power Company read its meters to the exact number of kilowatt-hours recorded on the registers. It was recognized, however, that an appreciable saving could be realized in meter reading and office clerical time, if readings and consumptions were shown only in even units. Studies were made along these lines, and in 1930 arrangements were made to read meters to the nearest even kilowatt-hour unit.

In 1943 it was decided to estimate consumptions for average bills issued in alternate months in the bi-monthly meter reading areas in multiples of ten rather than in even units. This practice was adopted only for consumptions in excess of fifty kilowatt-hours a month, because it was felt that some of the customers whose monthly consumptions are small might object to the variation between the actual consumption and the estimated consumption. This practice was followed for over two years without unfavorable customer reaction.

Early in 1945 studies were conducted to determine the advisability of reading meters in multiples of five or ten kilowatt-hours instead of to the nearest even kilowatt-hour unit. Preliminary studies showed that reading in tens would result in considerably larger savings than reading in fives, particularly in the billing operations which are performed on International Business Machines equipment. These studies also showed that it would not be practicable to apply the practice of reading in tens only to consumptions in excess of some given amount as was being done for average bills. Such a practice would make it necessary for the meter reader to read a meter and make the subtraction before he could determine whether the reading should be recorded in multiples of ten or in multiples of two. Also, office procedures would not be simplified because it would still be necessary to handle some accounts with consumptions ending in 2, 4, 6, and 8.

In May, 1945, arrangements were made to begin reading meters in multiples of ten kilowatt-hours. The practice applies only to meters with constants of 1; readings and differences for meters with constants of more than 1 are still recorded to the exact number shown on the registers. This is done because of the greater kilowatt-hour variations which would result when the differences are multiplied by the constants.

After the new procedure was in effect for several months, one additional change was made. This consisted of discontinuing the entry of the last digit (units digit) of the reading and consumption on the meter sheets carried by readers, for meters with constants of 1. These digits are always zeros and, therefore, can be omitted on those sheets. However, the readings and differences are still shown in their entirety on the company's billing records and on customers' bills.

Occasional inquiries have been received from some of the very few customers who use so little service that they often pay only the 60c. monthly service charge, which also constitutes the minimum charge, "Why," they ask, "does the bill jump to 88c. some months?" It is explained to these customers that they are not billed for electricity actually used until the meter shows consumption of an entire unit of ten kilowatt-hours. Accordingly, the customer is really underbilled until ten kilowatt-hours have been used; then a charge for ten kilowatt-hours is made, bringing the account up to date.

Servicing Electrical Appliances

By R. L. White

President, Landers, Frary & Clark and President of NEMA

Address before the Annual Meeting of the Edison Electric Institute, New York, N. Y., June 3, 1946

THIS problem of Servicing Appliances is an embarrassing one. It is primarily the problem of the manufacturer—yet other people—utilities for example—have to help us take care of our children. Service is our problem as manufacturers because fundamentally we get the most benefit from good service—and suffer greater loss of goodwill when it is not available. Good service is a goodwill builder. It's a potent sales weapon for the established brand name manufacturers. Good service means repeat sales, means sales of other products in our line. We may spend millions of dollars on product advertising—only to lose much of the goodwill by poor servicing. It may be true that others get criticized for service failures, but in the final analysis most of the blame falls on the maker of the merchandise. This is true whether or not the service is within the period of a manufacturer's free service guarantee.

Now all this has been lovely up to this point—here's a manufacturer freely admitting that service is his responsibility, that he gets much of the benefit from good service. Why not stop right here and all be happy? We cannot—because manufacturers are national and service is local. The manufacturer, with the best intentions in the world, can't handle service alone. He must call upon others who also benefit.

Wholesalers Must Help

The wholesaler does benefit from the goodwill resulting from good service but generally speaking, the wholesaler of non-franchise items such as small appliances does not enter in any important way into the service problem. However, the wholesaler operating under an exclusive franchise should be much interested in service, should see that his territory has proper service facilities, that dealers are educated, and possibly to a limited extent such wholesalers must have stocks of parts available.

Service Is Local, the Retailer Must Help

Service is as much a factor in a successful retail business as it is for the manufacturer and this goes for utilities that merchandise. Sales, particularly of major appliances, are often made because the consumer has confidence that there will be service and if I were a dealer, I would be very much interested in giving good service as a goodwill builder and to encourage repeat sales. Naturally, I would expect my Service Department to be self-supporting, but I would use it as a sales rather than a profit builder.

It's not a simple question for the retailer even where he has an exclusive franchise. He is constantly under pressure to give free service, and furthermore, his volume in many instances does not support a good service department. On the non-exclusive lines, the problem is even more difficult because the service is not tied to the sale and the dealer may be asked to service appliances sold by other dealers, sold by mail order or other long distance distribution. But by and large, in the small town and farm market, I do not see how the successful retailer is going to avoid helping out on this service problem. Also, if the retailer is a merchandising utility, I don't see how responsibility for service can be passed along.

In the metropolitan centers the manufacturer has in some instances set up his own service stations, but more common, I believe, has been the practice of setting up independent service stations whose primary business income comes from service activities. Such a setup usually involves handling the service for a number of manufacturers and either dealing directly with the consumer or with the dealer as an intermediary. The danger in such service stations not primarily interested in consumer goodwill is the charges will be too high or that unnecessary repair will be made. The same difficulty is found in automotive repair shops. Thus, the manufacturer must supervise as well as he can and the cooperation of the utility in reporting unfair practices will be helpful.

The Utility Has a Real Interest in Service

I know perfectly well that what I am saying this morning is nothing new to you. It would have been nice to have come forth with some sound but startling new analysis but there's nothing new about the service problem. The paramount interest of the manufacturer and the only slightly less important concern of the retailer in this problem has been mentioned but the utility, merchandising or otherwise, has a real interest in service. I cannot conceive that any sensible utility operator will wash his hands of the problem. I heard the comment the other day that the utility should not be responsible for service any more than a car owner expects the local filling station to repair his car. But if all the local filling stations were owned by one company, that company would be interested in seeing that the cars were kept in shape to run and thereby use his gasoline; and if there were two different kinds of fuel, let us say alcohol and gasoline, the fuel sellers of both types would be interested to see that there was adequate service. The utility with a monopoly cannot take the same position that the eighteen or twenty petroleum companies may do.

There are some outstanding examples of service in the utility field. You are all more familiar with them than I am. I am not here this morning to propose that utilities should extend their service facilities, but I do suggest that you cannot dismiss the problem by simply stating that it belongs to the manufacturer.

From our point of view, if the utility wishes to give service, it has many advantages. Many business offices adequately cover the territory whether urban or rural. Utilities are engineering minded with a technically trained staff—able to tackle such problems, and by and large the utility has the reputation for being reasonable in its charges.

You all know the disadvantages to the utility—ill-will where someone thinks service should be free, friction with dealers where the dealer wishes to handle service himself and, perhaps worst of all, when a utility is engaged in service the public assumes they have the facilities

and parts for servicing any appliance made by any manufacturer at any time and at a moment's notice.

The Manufacturer's Part of the Job

Having admitted that the manufacturer gets the most benefit from good service, what should he do to see that this service is given? In the first place he should see that there are adequate stocks of parts available at fair prices—complete stocks at the factory and stocks of the most important repair parts in strategic locations around the country.

Secondly, he can take steps to provide service promptly by making prompt shipment of spare parts where needed. A great many appliances, particularly the small ones, come back to the factory for repair anyhow, and prompt service is a great factor in goodwill. In my company, Landers, Frary & Clark—Universal Appliances—(I ought to be allowed to get a short commercial, don't you think?) we have taken steps to improve postwar service by setting all of our service operations aside in a special building where we carry repair parts, have facilities for plating, spinning, buffing, etc., entirely apart from any production facilities. When we discontinue a line, it is the responsibility of our service manager to see that adequate stocks of repair parts are made before the production facilities are dismantled. We think service is important.

Another responsibility of the manufacturer is to provide adequate service manuals including lists of repair parts and price lists and to see that the utilities and the dealers have this information. In our own company we plan when we can get things running a little more smoothly to have special men traveling from the factory to help our dealers in their service problems.

We are going to encourage the dealer to do a service job rather than to try to duck it by showing him the goodwill that he can get but this means we must help him, instruct him, teach his repair men, and we must constantly watch that the consumer does not pay unfairly.

On the non-exclusive lines in the bigger cities, the repair station method seems most satisfactory and frequently the franchise holder wishes to have the service work handled in the same manner. Here the manufacturer must see that the service station carries a representative repair stock, provide him with full information and must supervise.

Let me say right at this point that the utility companies deserve a large round of applause from the manufacturers for the fine job of service they have done in the past, and particularly during the difficult conditions that have existed since the war began. Certainly you did this service because you thought it was to your own best interests, but we recognize that much of it was done with the broad interest of the entire electrical industry—manufacturing and distribution—at heart. We thank you.

How the Utility Can Help

How can the utility that does not wish to undertake service itself help out in this problem? First of all you can operate service training programs. You can teach the dealer how to give proper service. You can train young men who wish to be repair men and help them get jobs with the local dealers. Right now I think you could build a lot of goodwill for yourselves by setting up such training program for G-I's, helping them to become service men and helping your own public relations. We, in the appliance manufacturing industry, are deeply concerned over the number of young veterans who without experience and with limited capital want to be appliance dealers. A large proportion of them are foredoomed to failure because of inexperience or because of overcrowding. I can think of no better way to start in the appliance business than to be trained by a utility as a service repair man and then get a job with an established dealer.

Another way you can help us is to act as a watchdog, distasteful as this may be. The manufacturer is not in contact with the consumer—we do not know where our service stations or our dealers are giving poor service or making overcharges which damage our reputation. You can help us. You can also help us by reporting troubles that develop in the appliances we make so that we may change the construction quickly if necessary.

One thing we ask you not to do although it has been done more than once; don't let your trouble shooters blame line troubles on appliances. The trouble shooter may think he is passing the buck but nobody will win.

One more way in which the utility can help; many of the service diffculties result from improper use of appliances. The utility home service organization can be of great assistance by helping the consumer to properly use his electrical equipment.

You see, you really can help us in this problem even though you get out of actual servicing yourself, and you are not doing it just to be helpful to us. Much of your own livelihood depends upon the satisfaction that electrical appliances give the consumer. We must encourage their use and the extension of their use. This is true whether or not there are substitutes for electricity. Where these substitutes—gas or L. P. gas are available—we must be even more aggressive on this service problem.

Service Can Be Improved

You have doubtless heard all of the alibis the manufacturers have given for poor service in the past five years. I want to tell you that we have all had a most difficult time. The service requirements increased tremendously because of the fact that new goods were not available and this increased service came at a time when we could not get material or labor. I am afraid that we have at least another six months of such conditions ahead of us, but the farsighted manufacturer realizes that competition is going to be extremely keen in the appliance field and service is going to be all important. The service problem is the manufacturer's baby and we are going to have to do a better job on it than in the past. We ask for the full help and cooperation of the utilities. After all they may be our appliances but they won't run without your juice.

Objectives of Better Light-Better Sight Bureau

(*Continued from page* 240)

ly mentioned by Mr. Restofski include a full-color Walt Disney Productions cartoon on the basic fundamentals of light and sight, with a complete package of supplementary materials; a sound-slide film entitled "See for Yourself," on the educational aspects of home lighting, and an outstanding sound-slide film on street lighting.

"The Bureau will continue to produce information and materials on the relationship of light and sight, and these will be of real value to those who have lighting products or services to sell," Mr. Restofski concluded.

Planning Distribution Facilities for Increased Customer Loads

By Frank Sanford

Western Editor, Electrical World

Formerly Superintendent Distribution Engineering, Cincinnati Gas & Electric Company, and past Chairman EEI Transmission and Distribution Committee

Address before the Annual Meeting of the Edison Electric Institute, New York, N. Y., June 4, 1946

OPPORTUNITIES FOR broad viewpoints in distribution policy planning that have seldom been equaled in scope are offered by the present plans for increasing customer loads. Load-building programs of the next few years will necessitate parallel distribution-building programs, with residential and commercial services moving to a primary position from their secondary place during the war.

A considerable portion of the expected load increases will be at the lower end of the rate scale and it is important that distribution costs conform. This problem for the distribution engineer may be stated as that of carrying more load on the distribution system without a proportionate increase in the investment. There are two factors contributing to make this possible.

First, keeping distribution abreast of load growth is largely a matter of replacing and supplementing overloaded units and, also, there are many increments in load carrying ability already existing in the lines and equipment. Capacitors are a further possible means of help in some cases.

Second, load density increases within the existing general service area contribute directly to a decrease in unit costs, and they may also make possible a revision of the design basis for further extensions and rearrangements.

Longer View Needed Also

There is a serious danger, however, in the fact that distribution grows by small steps and extensions. Because each addition does not by itself appear large on the investment record, the importance of planning, and of carefully considered standards and methods, may not always be apparent. Small differences in cost must be multiplied by hundreds or thousands of units and neglect of an overall viewpoint can offset the advantage gained by using only the increments for capacity growth.

Continuation in the downward trend of unit investment cost may depend to a large extent on the balance of several apparently unrelated factors.

(1) Most important on one side of the account is the load density increase in the period since many present practices in rating and arrangement were started.

(2) Second is a better understanding of thermal capacity and emergency ratings. Loading to the maximum economic value is parallel to load factor improvement in seeking to make full use of the facilities available.

(3) On the other side of the account is today's increased cost of construction. Maintenance and operation costs are also higher, and present comparisons with the cost of money may justify even greater investments.

(4) Higher line costs can be balanced by a longer life expectancy on the side of physical depreciation with the pole hardware protective treatments now available.

(5) There is relatively little spread between the complete costs of a distribution feeder for minimum loads and a line of similar construction for several times the minimum value of load.

The most direct answer to the problem may be its restatement in reverse—distribution facilities must have more load to carry to avoid an increase in the investment per customer. They must be planned for longer use, allowing for more load growth with less change and with less day-by-day cost. With fair assurance of continued growth through a period of several years, and with past experience as a guide, both the new additions and the rearrangement of older facilities can be developed along lines of permanence not always possible in earlier years.

Can Re-Plan Primary

Taking advantage of load density increase in primary feeder supply means an increase in the load that each substation and circuit unit is to carry. Circuits were originally limited in load rating largely by the practical length of line for voltage control and exposure to interruptions. Load-building of the future must be based on a continuation of good service, or on further improvement, but the base of this requirement has been changed. Improvements in protection available have combined with reduction in feeder length and exposure to give primary long-time outages in suburban areas measured in years between rather than number per year.

Normal ratings of feeders have been increased from 150 and 200 amperes to 250 and 300 amperes. Doubling these values to 500 and 600 amperes may be in order, with two trunk sections out to separated load centers. A step in this direction has been the occasional reconnection of regulators and the supply for two previous feeders from one regulator and switch position. Bus regulation, primary networks, unit-type installations or higher voltage distribution are indicated in other plans. Substations are being simplified, with tie or transfer busses and switches superseded by less expensive feeder ties. Portable substation units may further decrease capacity and switching requirements.

Emergency capacity reserves in feeder ratings are an important part of the investment in distribution. The reduction in frequency of outage, an increase in the number of feeders that may be tied together and higher emergency ratings based on thermal capacity all combine to decrease the margin of capacity needed on each feeder. While recognizing that very high emergency loading may involve some reduction in the normal life expectancy of transformers and regulators, it is also realized that the probability of an outage during annual peak load periods is small. As much as 20 or 25 per cent of the feeder capacity may

thus be released for normal load growth.

In the past two years there has been an acceleration of interest in aerial cable construction to improve reliability and appearance. While not new, this combination of traditional overhead and underground construction does present some new problems when considered for more general use. This interest may also be extended to the further development of buried or trench-lay cable systems as another possible method of compromise in the spread between costs of open wire and duct installation. Cable will increase line costs still further and add emphasis to the importance of advance planning because it is less flexible than open wire for rearrangement and replacement.

Transformers Are Underloaded

Distribution transformer investment is of the order of 15 per cent of total investment to serve residential and small commercial load. Transformers are at the same time the most flexible major items on the distribution system. Expense to change from one size to another at the same location is in general less than the annual investment charge on the average suburban unit. Expense to check load on a carefully supervised schedule is less than 10 per cent of the annual investment cost. With ratings subject to engineering interpretation, the sizes installed should be based strictly on the load served and not on rough approximations.

A maximum ratio of short-time peak to nameplate rating of 145 to 160 per cent represents good practice before increasing the size transformer. With careful supervision, the average peak load to connected capacity ratio on a feeder may well exceed 100 per cent. It is difficult to compare one system with another with any exactness, but a pre-war survey (reported in EEI Publication H6) showed that typical results are as low as 75 per cent. All of the data presented for this survey indicated that actual failure due to overload has not been a problem on any system.

A large step forward in transformer practice has been made by EEI and NEMA through adoption of a set of standards to replace the almost unlimited number of combinations of details. A common denominator was found in the direct mounting bracket and a few standard dimensions. Progress in transformer design is in no way impeded by acceptance of these features, and standard ratios and taps, which should halt the pyramiding of variations for units which must be interchangeable for economic application.

Secondaries Are Adequate

Back in the days when refrigerators represented the major load-building addition to lighting, flicker complaints led to programs of changing secondaries from sizes of about No. 6 to about No. 2. Numerous studies showed the wide economic loading range of the latter size, or the size under or over, and the trend toward this as a standard secondary was quite general. Incidentally, the cost of changing secondary systems to make them free from lamp flicker produced by motor-starting currents has probably exceeded investment for normal feeder voltage regulation.

The point to note now, however, is that the upper limit of economic loading is five or as much as ten times the present averages. The change in wire size, as compared to alternative practices of using auto-transformers or banking, has been justified by load growth. It is safe to conclude that where No. 2 wire is installed no further change need be made in secondaries for the maximum expected saturations of appliances now in sight. It is to be hoped though that air-conditioning units and other large fluctuating loads do not force a new version of the previous change for voltage control ahead of load requirements.

Build Around Load Analysis

Studies for distribution economics and load analysis were given increased attention by the industry committees in the years just before the war. The period of enforced curtailment of new construction has in many cases confirmed the upper limits of loading that still would not cause excessive failures. At the same time, the wisdom of spare capacity for growth has been demonstrated. Somewhere between these limiting factors a practical band of operation exists for each system, and load building for the distribution engineer should start with detailed load analyses for the individual system.

Economic use of distribution facilities can be accomplished only by assignment of load limits to each part and the periodic checking of the many units involved to stay within these limits and yet not change before it is necessary. A continuous schedule of load and voltage surveys is essential to such a program of detailed supervision. Ampere readings at the substations only are not sufficient except at the expense of an increase in emergency replacements and poor service or of overbuilding.

Commercial planning as well as distribution planning will be helped by more small area checks of the characteristics of load appliances in various combinations. Range saturation, for example, is a common measure of load-building. Beyond that, it is important to know the hours use and the effect of this saturation combined with the equivalent information on water heaters, and then with all the more common appliances and lighting.

Some of this information can be summarized in typical daily and seasonal load curves for the industry, but there is not now enough available data to serve for all individual service areas. Several industry committees are sponsoring further studies along this line. Many more summaries, such as EEI Publication F3, are needed and every distribution division should be equipped for test surveys of its own conditions.

Voltage control is often a greater factor than ampere loading in design. The limits within which voltage is to be maintained and the ratios of various voltage devices are therefore of critical value in the economics of distribution. A report on preferred voltage ratings, prepared by joint action of EEI and NEMA, is now ready for trial use as the accepted basis for design of appliances, equipment and distribution. It represents compromise within a considerable area of possibilities. In the final analysis both the manufacturers and the utilities are serving the same customers and the best solution is that which offers the lowest overall cost to the customers of both.

Two Segregated Loads

Modern load analysis and construction design have a tendency to simplify two classes of service which, although parts of distribution, are frequently set off by themselves when data and plans are gathered on the table for consideration. Street lighting was started with series circuits before the first Edison lamp, and residential water heating was started with separate metering and time switches to build low demand cost load in the valley of generation curves.

Lighting on the streets in residential areas of most cities is still far from the standard that should be sought, but even

with allowance for growth, it is only a small fraction of the other present and expected loads on distribution. For example, in an area of 1500 kw residential load, street lighting, load is of the order of 50 kw. It approximates a 10 or 15 watt night light used by each residential customer.

Street lighting service has progressed from separate generators, through supply from mercury-arc rectifiers to constant current transformers. Multiple lamps now parallel series lamps in design and ratings and, except for the most detailed consideration of light variation due to normal voltage changes on the secondary mains, they are equivalent in application. The present interest in aerial cable raises a question on the separate feeder and arms for this load which has been segregated.

Water heating may be an ideal off-peak load builder at low saturation, but for the distribution facilities this load actually establishes the peak when it reaches a fair degree of use. Large storage tanks with large heating units are necessary to meet the time requirements of night off-peak rates, and there can be little or no diversity among the heaters themselves. Water heaters determine the demand on any one transformer, feeder or substation when the saturation of large units in that particular area reaches five per cent with an equal number of ranges. Even with 50 per cent of customers having ranges, off-peak heaters should not pass 15 per cent. It is evident that distribution load analysis is important in considering this commercial policy.

The Bottleneck in Distribution

Distribution cannot be considered as a unit operation. There are no building walls or fence lines and no points of switching or metering to set it apart. It is on the public streets, its voltage and protection arrangements must be coordinated with other parts of the utility system, and its quality is measured at appliance and lamp outlets. Interior wiring is a part of the total system because amperes cannot recognize the convenient dividing line of a service entrance or meter board.

This wiring, with a total mileage exceeding that in the utility system, must not escape its share of scrutiny in the engineering of primaries and secondaries. Blotches are put on the best continuity and voltage betterment programs when flickers and blown fuses interfere with customer satisfaction. And no amount of added investment in utility distribution can take the place of an adequate service and wiring installation.

Service entrances and wiring capacity in perhaps one-half of the residences of the country are still in the 1920 pattern. If a campaign of the scope originally used in wiring homes in many cities could again be arranged for service entrances and branch circuits to kitchens and laundries, the washers, driers, roasters, stokers and other loads could be served. There is no better opportunity for a broad viewpoint in distribution policy planning.

Present distribution facilities can carry much heavier customer loads without any important increase in distribution investment, by increment growth and some changes step-by-step with the load. For the long pull, the trend can be continued only if the new load conditions are recognized in advance. Major substation plans, subtransmission and inside wiring must all be included in the view for economic growth of distribution.

Discussion of Mr. Sanford's Paper

By J. H. Foote

Supervising Engineer, The Commonwealth & Southern Corp.

Address before the Annual Meeting of the Edison Electric Institute, New York, N. Y., June 4, 1946.

MR. SANFORD'S paper on "Planning Distribution Facilities for Increased Customer Loads" is an excellent summary of the subject. It is exceedingly meaty and warrants consideration and sober study by all who have to do with the planning for increased loads and for serving them satisfactorily.

The general viewpoint expressed is that there generally exists in present distribution systems a certain amount of inherent capacity for increased loads which can be utilized by skillful planning and judicious rearrangement and amplification of distribution system plant. Thus it is suggested that transformers are able to withstand greater loads; that secondaries are generally adequate if of approximately No. 2 AWG copper size; that primaries can be rearranged for greater load carrying ability, yet with greater reliability; all this if skillful long-range planning is the order of tomorrow.

One can but agree sincerely and heartily with these tenets and conclusions. At the same time emphasis and more detailed discussion seems warranted with respect to two or three of the constituents mentioned as essential in providing for increased distribution system capability.

There is the matter of quality of voltage supplied to the customer. Mr. Sanford suggests that voltage drops as well as equipment heating and line losses must be recognized in any program involving significant increases in load on present transformers and secondaries. It must be recognized that the allocation of voltage drop allowances to the component parts of the distribution system presents to the distribution engineer his greatest challenge and his greatest opportunity in order that a fine economic balance be attained. He must dole out frugally but with knowing confidence the few volts at his disposal to the service, to the secondary main, to the transformer, and to the primary main. The allowable variations in these allocations throughout the daily cycle of shifting load demands must be charted. Sudden variations produced by short-time demands must be taken into account. Such may be produced by the starting of motors, the operations of a welder, or the warming up quickly of ranges by housewives late in starting supper. It may be found that a transformer-secondary combination which is adequate to hold the voltage drops within the allotted

amounts for a short-time load of this nature will automatically provide for steady loads of a surprisingly large value.

For instance, the studies of the Joint Committee on Motor Starting Currents developed the significant observation that a transformer-secondary system adequate to handle the voltage flicker produced by single phase equipment having the recommended starting current characteristics would also be adequate from a voltage drop standpoint to serve a range saturation of 40 per cent on the same secondary system if suitable augmentation of transformer and primary capacity were provided.

Too much attention cannot be paid by commercial and distribution engineering executives to the problem of voltage flicker produced by customers' equipment and the solution of this problem by preventive measures wherever possible.

Another subject of concern relates to the domestic water heater which is briefly touched upon by Mr. Sanford. Much misunderstanding of this problem has been alleviated in recent years by the constructive work of the engineering committees in collaboration with the Water Heater Group of NEMA.

Mr. Sanford points out that in order to insure that the domestic water heating load appear entirely at off-peak times the percentage of customers utilizing this equipment must be limited and large storage tanks must be used. However, with the development of the domestic storage type of heater having two carefully proportioned heating elements interlocked and judiciously controlled in a manner to take care of the particular distribution and power supply situation, it is possible to serve a relatively large number of domestic customers with electric water heater service and to supply a substantial proportion of this water heater load at other than peak periods. The comparatively low demand and inherently long-hour charging rate of the NEMA standard two-element heater makes this possible in a majority of the situation encountered. This is probably not the place to discuss at length the serving of domestic water heater load, but domestic water heaters will undoubtedly form one of the most substantial components of increased residential loads in the years to come, and a positive and constructive long-range plan for serving this type of equipment is required on many systems. It is felt that means are available for serving water heaters of proper design economically, and the problem largely develops into one of coordinating commercial and merchandising policy with rate structure and distribution economics.

And that directs attention to the necessity for management-wide coordination of planning for the increased loads we all expect. Departmentalization is a device increasingly necessary the larger the organization. Most electricity supply operations are thoroughly departmentalized with responsible heads usually coordinated at the executive level. The responsibilities of each department head relate primarily to the successful performance of his particular organization.

Thus the merchandise manager may be given the responsibility for seeing that a certain volume of cooking devices or of domestic water heaters are placed upon the system. That's his job and he will naturally go at it in the way that achieves the goal most readily, and in the achievement of this goal he may sell a device at a saving of $10.00 to the customer which may require the investment of much more than this amount in the company's plant in order that it may be served satisfactorily. At the same time the Rate Department may have assumed that the cost to serve this particular load is incremental in character so that nothing has been provided in the rate for the additional plant necessitated by the characteristics of the device. All this may add up to a net loss from the standpoint of the overall operations of the company.

This does not constitute the pointing of the "guilty finger" at any one in particular. It merely means that in the interest of the entire operation of the company there should be effective coordination among distribution engineers, system planning engineers, commercial executives, those responsible for the merchandising, and those establishing rates in order that all of these considerations may be based on the same set of costs and considerations.

Undoubtedly department heads and top executives are generally aware of their interdependence with regard to these problems. It is suggested, however, that their practical coordination is usually limited by the lack of adequate time and opportunity to engage in the detailed operations required if effective coordination is to be a reality. A genuinely significant feature of the process of planning distribution facilities for increased customer loads, therefore, should be the setting up of adequate coordinative processes at the level of the planner or designer. Usually a simple routine involving personal contact and exchange of views would be all that is required, assuming that those on the planning level understand that such is the wish and indeed the requirement of the executives.

Increased customer loads of tomorrow will involve the sale of large amounts of current at a very low price. It will be necessary that the skill and coordination of the entire organization be directed toward the serving of these increased loads in the most economical manner possible in order that customers may continue to enjoy the remarkably low cost of a service whose quality will continue to increase.

Farming for Better Living Clubs

An editorial in the Buckhannon, W. Va. News

"ATTENTION STOCKMEN—According to the Gestation Table printed by the Farming For Better Living, these dates will be of interest:

"A cow serviced July 1, will calve April 10, 1947; a sow serviced July 1, will produce pigs Oct. 21, 1946; an ewe, Nov. 28, 1946; a mare, June 6, 1947.

"The Farming For Better Living clubs, sponsored and organized by the Monongahela Power Company, had done more for the betterment of West Virginia than any other one thing of which we can think. These Farming For Better Living organizations teach and live horse-sense fundamentals. The best thing they teach is Conservation of Top Soil. These members of the Farming For Better Living now Know that it takes about a thousand years to deposit the precious topsoil that can be washed away in a few minutes with hill-draining rains. These club members are practicing and teaching others horse-sense rules to prevent the washing-away of this life-giving top-soil—You can't get bread from a rock.

"As well-meant advice, we would suggest that any farmer and his family who do not belong to a Farming For Better Living club, join them and get the benefits of Proven experiments that have made West Virginia farms, and the living thereon so much better.

"Editor's Note: This is no paid advertisement. As a West Virginian who is interested in the welfare of the state, we just felt like saying what we have."

Pacific Coast Electric Association Celebrates 25th Anniversary

WITH a registration of 941, 50 per cent greater than at any previous meeting, the Pacific Coast Electrical Association, celebrating its 25th anniversary, held the greatest convention in its history at San Francisco, June 12-14. A number of national figures, many from outside the electrical industry, dealt with some of the economic and social problems that confront the nation.

Former Governor of Colorado, Ralph L. Carr, advocated a sound program for the marketing of federal power in which the power would be distributed through existing facilities, private, municipal and state. Such a policy would realize substantial economic benefits by avoidance of duplicating investment in unnecessary facilities.

"With all the new material available to the public, we are not going to do an adequate lighting job in the home unless someone designs and sells it," declared Myrtle Fahsbender, director of residential lighting, Westinghouse Lamp Division, Bloomfield, N. J. Primary interest rests with the utilities, she said.

California farmers are opposed to federal distribution of Central Valley power because every dollar invested in transmission lines increases the cost of irrigation water to the farmer, pointed out J. J. Deuel, California Farm Bureau Federation. From the standpoint of the irrigationist the best deal is for sale of power output at the dams, he said.

Leonard E. Read, Foundation for Economic Education, New York, said that a program of education is the only way to acquaint the public with the fundamental facts of economics to combat the wave of collectivism that is sweeping America.

"We are on the threshold of industrial use of atomic power, but temperature, corrosion and shielding are major obstacles still standing in the way," stated Prof. Luis W. Alvarez, of the University of California Radiation Laboratory, Berkeley. He reiterated that atomic energy would merely supplement fuel and water power and would not materially affect present energy costs.

In the opinion of H. Vernon Scott, Tax Equality Association, Chicago, the greatest threat to private initiative and free enterprise are the tax-exempt cooperatives which today do an annual volume of $12,000,000,000 and will be doing $50,000,000,000 within five years. Tax equality is the only corrective step, and fortunately Congress is becoming concerned and may do something about it.

Ralph J. Cordiner, vice-president and assistant to the president of General Electric Co., in discussing some "Opportunities and Responsibilities," said that existing inequalities of labor and management are a serious barrier to full production economy, without which the nation stagnates. That labor itself will ultimately realize its stake in a producing enterprise economy, is the most hopeful outlook. Cordiner announced that the General Electric Co. will have eleven plants in the West, exclusive of Hanford, that will employ 10,000 workers, in its decentralization plan.

George F. Meredith, American Public Relations Association, New York, speaking on "Getting Along With People," said that things are done by people and that public attitude toward a corporation is determined solely by the people that represent it. People break down into specific groups, and the only way to poll real public attitude is through a survey by an impartial outside disinterested agency. If public relations are bad, stop doing things people don't like, he declared.

One day of parallel sessions of the Business Development, Operating Economics, and Administrative Services Sections gave these groups opportunities to deal with their specific problems.

Milton G. Sanders, vice-president, Central Arizona Light & Power Co., was elected to the presidency of the association to succeed K. M. Ryals, Stone-Ryals Co., San Francisco.

Meter and Service Committee Meeting

J. A. Morris, *Chairman*

THE twenty-eighth meeting of the Meter and Service Committee was held on June 17, 18 and 19 together with the Committee on Metering and Service Methods of the A.E.I.C., at the New Ocean House, Swampscott, Mass. There were forty-four members and guests in attendance.

A report from the Subcommittee on Meter Terminal Blocks was submitted by the chairman of this committee and progress reports were submitted by the chairman of the Joint Committee on Industry Standards on three subjects which this subcommittee has for consideration at the present time.

There was considerable interest in the subject of corrosion to outdoor meters and metering equipment. In some sections of the country this problem has become quite serious. A subcommittee entitled "Corrosion Prevention and Protective Coatings" was appointed to study the damage to meters which has been reported on the west coast and in some of the mining sections of the country.

Considerable time was devoted to the discussion of the subject of standardization which, in the opinions of the members, is extremely important at this time, in order to prevent further increases in watthour meter costs brought about by the increased costs in labor and material.

The supply of the Meterman's Handbook, the fifth edition of which was published in 1940, is at present exhausted. A subcommittee was appointed to determine what action should be taken regarding the reprinting or revision and printing of this manual. It is expected that there will be a demand for this book from foreign countries since no orders have been received from this source since the outbreak of the war. In addition there are at present unfilled orders for several hundred copies of the booklet at the Institute headquarters.

The Joint Committee on Industry Standards was requested to collect all of the standardizing data that have been adopted by the Meter Committee over a period of years and to make this material available in one pamphlet. There were general discussions on the subjects of meter entrance devices, standards for high voltage metering installations, meter bearings, and meter sockets.

The third day of the meeting was

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PERSONALS

GEORGE W. GILLIAM has been elected a vice president of the Central Power & Light Co., Corpus Christi, Tex. Mr. Gilliam has been identified with Central Power and Light for the past 22 years. He became a member of the executive dpartment last November after serving as a naval officr for several years during th war. Before joining the Armed Forces he had been a division manager of the company's Gulf Coast and Corpus Christi districts.

H. T. BRYANS has been appointed superintendent of Delaware Station of the Philadelphia Electric Co. He was formerly superintendent of Barbadoes Station. While a student at the University of Pennsylvania, Mr. Bryans worked for the Westinghouse Electric & Manufacturing Co. during summer vacations. He joined Philadelphia Electric following graduation. JULIUS N. HENTER has been appointed superintendent of Barbadoes Station. He started with the company in 1922. CHARLES W. WATSON was named assistant administrative engineer, electric operations. He became identified with the Philadelphia utility in 1931 and since 1944 has been engineer in the station operating department.

J. L. DAVIDSON has been named sales manager of the Savannah Electric and Power Co., to succeed GEORGE H. JOHNSON, who has resigned to join the El Paso Electric Co. Mr. Davidson, after several years' sales experience in other businesses, was for ten years associated with the Virginia Electric & Power Co. in various capacities. Afterwards he was connected with the Blackstone Valley Gas & Electric Co. in Pawtucket, R. I., for a short time, then in the New York office of Stone and Webster Service Corp. from 1939 to 1944, when he was made sales manager of the Fall River Gas Works Co., Fall River, Mass.

N. E. FRENCH has been appointed manager of the new rate department of the Philadelphia Co. and subsidiary companies, recently organized through the combination into a single organization of the rate and statistical departments. Mr. French was manager of the former rate department. Before entering the employ of the Philadelphia Co. in 1928 he was a case investigator for the Wisconsin Public Service Commission. He is a member of the Engineers' Society of Western Pennsylvania.

Organization changes which took effect recently in the United Illuminating Co. of New Haven and Bridgeport, Conn., resulted in the following new appointments:

WALTER A. UPHAM became chief engineer in charge of the engineering department, reporting to Russell G. Warner, vice president in general charge of all engineering activities of the company. EDWARD H. WALTON succeeded Mr. Upham as general superintendent of distribution. TRACY FABIAN was appointed superintendent of distribution for the Bridgeport division.

Mr. Upham first became identified with the company in 1927 as an electrical engineer. Soon afterward, he was appointed superintendent of distribution for the Bridgeport division. In 1940 he became general superintendent of distribution for both the New Haven and Bridgeport divisions of the company.

Mr. Walton has been with the company since 1939, when he relinquished his duties as division superintendent with the New Jersey Power & Light Co. He began with the United Illuminating Co as assistant superintendent of distribution for the Bridgeport division, and was promoted to superintendent in 1940.

A graduate of the Sheffield Scientific School at Yale University, Mr. Fabian has had a broad utility experience both with the New England Power System and with the United Illuminating Co.

RANDALL J. MILLER, trade relations supervisor of the Electrical League of Cleveland, has been named assistant residential sales manager of the Cleveland Electric Illuminating Co. Mr. Miller has a long record of sales experience. He had spent 13 years in the retail selling field prior to joining the League, where he has been employed for ten years.

JOHN VAN VEEN has been appointed to the newly created position of assistant manager of the electric department, Cincinnati Gas & Electric Co. S. M. HAMILL, JR., assistant superintendent, electric operating department, has been promoted to superintendent, the position formerly held by Mr. Van Veen.

Mr. Van Veen joined the company in 1913, advancing to hold the positions of electrician, chief electrician, chief operator and superintendent. He joined the Cincinnati Gas staff soon after arriving in the United States from Holland, where he was born. He is a member of the American Institute of Electrical Engineers and the Society of Professional Engineers of Kentucky.

Mr. Hamill started with the company in 1923 as a substation operator. Later he became maintenance electrician, test electrician and chief test engineer before being named assistant superintendent in 1930. Mr. Hamill is a member of the American Institute of Electrical Engineers and American Society of Mechanical Engineers.

JOHN K. WALTER has been appointed supervisor of training for the operating department of West Penn Power Co., Pittsburgh. Mr. Walter has been with the company for twelve years and before entering military service was assistant to P. H. Powers, vice president.

THOMAS M. BURTON has been appointed chief engineer for steam stations, Boston Edison Co., succeeding the late Richard Brown. He joined the company in 1916 as a watch engineer, and in 1939 became assistant chief engineer of the L Street station in South Boston. In 1941 he was named assistant chief engineer of steam stations, and held that position until May 15 of this year, when he assumed his present responsibilities. C. R. IRVING and H. E. STICKLE have been named assistants to the chief engineer of steam stations.

CHARLES E. REITZEL has been appointed Auditor of Receipts of the Electric, Gas, Steam and Merchandise Receipts Division of the Accounting Department, Philadelphia Company and Subsidiary Companies, Pittsburgh, C. T.

Harmon, Controller for the Companies, has announced.

Born and educated in Pittsburgh, Mr. Reitzel entered the employ of the Companies in June, 1912, as a billing clerk, and has since served in various clerical and accounting capacities, most recently being Assistant Auditor of Receipts.

Mr. Reitzel is a veteran of of World War I and a member of Beaver Falls Post, American Legion. He is married and lives at 40 North Sprague Street, Bellevue.

Appointment of two new department heads to fill vacancies created by recent deaths has been announced by the Rochester Gas and Electric Corp. of Rochester, N. Y.

SYDNEY ALLING, 281 Berkeley Street, was named manager of the Industrial Department to succeed the late Ivar Lundgaard. Mr. Alling was graduated from the University of Rochester in 1909 after which he attended Massachusetts Institute of Technology for two years, receiving his Electrical Engineering degree in 1911. He entered the employ of the R. G. & E. in 1911 and served with the engineering, construction, distribution and industrial departments. Since 1931 he has been on the staff of the Industrial Department.

RALPH H. MCCUMBER, 80 Somershire Drive, has been appointed Superintendent of the Electrical Department to succeed Walter J. Consler, recent victim of an automobile accident. Mr. McCumber entered the University of Rochester with the class of 1921 but the first World War interrupted his college career. After a period of service with the U. S. Navy he returned to the U. of R. and was awarded a B.S. degree in Mechanical Engineering in 1925. While still in college he entered R. G. & E. employ at Station 3 and filled various positions in the department of electric and steam generation. Since 1940 Mr. McCumber has been Superintendent of Steam and Electric Generation.

KENNETH W. GODFREY has been appointed Southern Division Engineer for West Penn Power Company at Connellsville, according to an announcement by Vice President P. H. Powers. He succeeds Ralph C. Dewey, recently appointed to the position of Superintendent of Lines for the Company's Central Division. Mr. Dewey succeeds the late D. L. Colborn, who made his headquarters at Charleroi.

A 22-year veteran of the Company, Mr. Godfrey was employed in April 1924 in the Maps and Records Department, Pittsburgh office. He was transferred to Connellsville as Engineer in September 1930 and three years later was promoted to Assistant Southern Division Engineer.

Mr. Godfrey is a veteran of World War II and served more than three years in the U. S. Army. At the time of his honorable discharge last April, he held the rank of Captain.

Mr. Dewey, a 20-year veteran employee, started with West Penn in April 1926 in the Company's Pittsburgh Offices as an Engineer, and was transferred to Washington in 1927. Eight years later he moved to Connellsville as Southern Division Engineer, which position he held until his recent promotion.

A graduate of Bliss Electrical School, Washington, D. C., Mr. Dewey is a registered professional engineer, and a member of the American Institute of Electrical Engineers.

HERBERT HENDERSON has been appointed Assistant General Manager of Iowa Electric Light and Power Company. This appointment gave official recognition to duties which Mr. Henderson has been carrying on for some time. OWEN TISDALE has been appointed assistant to Mr. Henderson.

Mr. Tisdale, who has been with the company 32 years, was formerly in the accounting department, and since April, 1940, has been district manager at Marshalltown. The new position recognizes his special talent in such fields as the analyses of operating statements and he will relieve Mr. Dows and Mr. Henderson of much detail in connection with statistical studies on various phases of company management.

Replacing Mr. Tisdale at Marshalltown, D. M. SHIVELY has been appointed district manager. Mr. Shively also started with the company 32 years ago. His first job was that of inside wireman, but under the tutelage of J. P. Walters, he rose rapidly through such jobs as line foreman and assistant district manager to become division manager of the Toledo Division when Mr. Walters became General Sales Manager. His next step was to be Assistant District Manager of the Marshalltown District, which he will now head.

McCall Award Again Offered for Home Service Activities

THE Laura McCall Award, sponsored by McCall's Magazine, will again be offered, through the Edison Electric Institute, for outstanding work by utilities in the field of Home Service during the calendar year 1946.

This award is offered to business-managed utilities and individuals in those companies, who during 1946 make the greatest contribution to homemakers through home service activities, by promoting interest in and better use of electricity in food preparation and preservation, wiring, lighting, cleanliness and in general, advancing the benefits of efficient electrical living in the home.

Five prizes are offered, consisting of a plaque, illuminated parchments, and a total of $400 in savings bonds and stamps.

Details concerning the McCall award may be secured from the Edison Electric Institute, 420 Lexington Ave., New York 17, N. Y. Entries for 1946 must be mailed to EEI not later than February 15, 1946.

Meter and Service Committees

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opened to the manufacturers representatives who presented new developments in meters and associated equipment, also new instruments and test equipment. The members were very much interested in the reports of the present rate of meter production in view of the fact that deliveries of meters are seriously affected by labor difficulties. The manufacturers representatives also discussed the factors which could affect their output during the next year and thereby create a more acute situation than at present. If no material shortages develop it is expected that the 1946 output will exceed that of 1940 and the 1947 output will be very much greater still. This acceleration in manufacturing will continue for several years in order to overcome the limited output necessitated by war time conditions when all of the manufacturers were called upon to produce specialized equipment for the armed forces.

The next meeting of the Meter Committee of the EEI and AEIC is scheduled for October 1, 2 and 3 at the Roosevelt Hotel, New Orleans, La.

Kent Succeeds Maxwell

(*Continued from page 232*)

New York City. For several years his principal responsibility was the organization and execution of joint development and research work, with representatives of the Bell Telephone System, on coordination of power and telephone systems. He was also active in coordination work with the Western Union Telegraph Company, and the American Association of Railroads. He also acted as consultant to member companies, in solving numerous operating problems requiring coordination with communication facilities.

In addition to other duties as a staff engineer, he has served as secretary for the EEI Electrical Equipment and Industrial Relations Committees, and has supervised the staff work for the Prime Movers and Transmission and Distribution Committees. He has been associated with a number of joint industry projects with other trade associations, and has also taken part in many standardization activities of the American Standards Association.

More Power to America Program

(*Continued from page 254*)

fuel costs climb. The fact that exhaust steam from a steam engine may be used for heating water leads many operators to feel that the cost of producing power is negligible. This is not necessarily true. From 5 to 25 per cent of the heat in the steam used by an engine is consumed by it, leaving only 75 to 95 per cent available for use in heating water.

"Additional costs should be given consideration. Interest on the investment in a private power plant, depreciation, taxes, insurance, light, lubricating oil, maintenance, and labor all should be charged against private power production. Often the use of a private plant requires the employment of a high-salaried engineer, while a plant buying public power could get along with a fireman."

This change is certain to make itself felt in the attitude of laundries in every utility's area. Already one utility which hasn't yet had opportunity to sponsor the laundry programs, has reported that a customer has replaced a 200-kw steam-engine-driven generator with purchased power as a result of the American Institute of Laundering's latest announcement.

CONVENTIONS AND MEETINGS

1946

JULY

10 Electric Companies Advertising Program, Management Group Meeting, New York, N. Y.

AUGUST

22 Electric Companies Advertising Program, Copy Group Meeting, Greenwich, Conn.

SEPTEMBER

5-7 Rocky Mountain Electrical League, Estes Park, Colo.
11 Electric Companies Advertising Program, Management Group, New York, N. Y.
15-18 Controllers Institute of America, Commodore Hotel, New York, N. Y.
16-17 American Transit Association, Palmer House, Chicago, Ill.
18-21 Illuminating Engineering Society, National Convention, Chateau Frontenac, Quebec, Can.
23-25 Northwestern Section, IAEI, Boise Hotel, Boise, Idaho.
25-27 Indiana Electric Association, French Lick Springs Hotel, French Lick, Ind.
30-Oct. 2 Southwestern Section, IAEI, Hotel Sacramento, Sacramento, Cal.

OCTOBER

1-3 Meter and Service Committee, EEI, Hotel Roosevelt, New Orleans, La.
3-4 Southeastern Electric Exchange, Engineering and Operation Sections, Henry Grady Hotel, Atlanta, Ga.
4-5 Electrical Equipment Committee, EEI, New Ocean House, Swampscott, Mass.
7-8 Transmission and Distribution Committee, EEI, Cavalier Hotel, Virginia Beach, Va.
7-11 American Gas Association, Atlantic City, N. J.
7-11 National Safety Congress, Hotels Stevens, Congress and Palmer House, Chicago, Ill.
14-16 Southern Section, IAEI, George Vanderbilt Hotel, Asheville, N. C.
14-18 National Electrical Contractors Association, Ritz Carlton Hotel, Atlantic City, N. J.
17-18 Southeastern Electric Exchange, Accounting Section, Fort Sumter Hotel, Charleston, S. C.
21-23 Western Section IAEI, Gibson Hotel, Cincinnati, Ohio.
24-25 Pennsylvania Electric Association, Electrical Equipment Committee, Lord Baltimore Hotel, Baltimore, Md.
27-31 National Electrical Manufacturers Association, Annual Meeting, Marlborough-Blenheim and Claridge, Atlantic City, N. J.
28-30 Eastern Section, IAEI, Mark Twain Hotel, Elmira, N. Y.

NOVEMBER

12-15 National Association of Railroad and Utilities Commissioners, New Orleans, La.

DECEMBER

2-6 The American Society of Mechanical Engineers, Hotel Pennsylvania, New York, N. Y.

1947

APRIL

March 31-April 3 Thirteenth Annual Sales Conference, EEI, Edgewater Beach Hotel, Chicago, Ill.
7-9 AGA-EEI National Accounting Conference, Hotel Statler, Buffalo, N. Y.
28-30 Engineering Committees, EEI, Edgewater Beach Hotel, Chicago, Ill.

MAY

27-29 National Association of Purchasing Agents, Chicago, Ill.

JUNE

2-5 EDISON ELECTRIC INSTITUTE, Annual Meeting, Atlantic City, N. J.

EDISON ELECTRIC INSTITUTE OFFICERS AND COMMITTEES

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(Continued)

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